# Acer

# Aspire X3400/X5400
# Service Guide

# Revision History

Please refer to the table below for the updates made on this service guide.

| Date | Chapter | Updates |
|------|---------|---------|
|      |         |         |
|      |         |         |
|      |         |         |

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# Conventions

The following conventions are used in this manual:

| | |
|---|---|
| **SCREEN MESSAGES** | Denotes actual messages that appear on screen. |
| **NOTE** | Gives additional information related to the current topic. |
| **WARNING** | Alerts you to any physical risk or system damage that might result from doing or not doing specific actions. |
| **CAUTION** | Gives precautionary measures to avoid possible hardware or software problems. |
| **IMPORTANT** | Reminds you to do specific actions relevant to the accomplishment of procedures. |

# Service Guide Coverage

This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for Acer's "global" product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.

# FRU Information

Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

# Table of Contents

# System Tour

# Features

Below is a brief summary of the computer's many features.

**NOTE:** The features listed in this section is for your reference only. The exact configuration of the system depends on the model purchased.

## Processor

❏ One AM2+ socket

❏ AMD Phenom II X4 805/810/820/900E/905E/910/925 processor

❏ AMD Phenom II X3 545/550/700E/705E/710/720/740 processor

## Chipset

❏ nVIDIA GeForce 8200 (MCP78PV) chipset

## Memory subsystem

❏ Four DDR3-667/800/1066/1333 MHz DIMM sockets

❏ Supports single channel or dual-channel memory mode

❏ Maximum of 8 GB supported

## Media storage

❏ Super-Multi DVD drive

❏ BD Combo, BD-ROM, BD-RW drive

❏ SATA hard disk drive

## Serial ATA controller

❏ Embedded SATA controllers

❏ Two SATA ports

❏ eSATA port

## Audio

❏ HD audio codec ALC888S

❏ Five audio jacks

## Networking

❏ Marvell 88E1116 Intel WG82567V Gigabit NIC

❏ One Gigabit Ethernet LAN port (RJ-45)

## PCI I/O

❏ PCI Express x16 bus slot

❏ PCI Express x1 bus slot

# I/O ports

❑ Front
  - Five USB 2.0 ports
  - Headphone/speaker-out/line-out jack
  - Microphone-in jack
  - 9-in-1 media card reader — CompactFlash® (Type I and II), CF+™ Microdrive, MultiMediaCard (MMC), Reduced-Size MultiMediaCard (RS-MMC), Secure Digital™ (SD) Card, xD-Picture Card™, Memory Stick™, Memory Stick PRO™

❑ Rear
  - PS/2 keyboard port
  - PS/2 mouse port
  - Five audio jacks
  - HDMI port
  - eSATA port
  - Four USB 2.0 ports
  - Gigabit LAN port
  - VGA/monitor port

# Operating system and software

❑ Operating system
  - Windows 7 Home Premium x64
  - Windows 7 Home Premium X86
  - Windows 7 Home Basic X86,
  - FreeDOS
  - Linux LL95

❑ Applications
  - Acer eRecovery Management
  - Acrobat Reader
  - Acrobat Flash Player
  - Arcade Deluxe
  - Cyberlink Power Director
  - McAfee Internet Security
  - MyWinLocker
  - Microsoft Works
  - Nero 9 Essentials

# Power supply

❑ 220-watts (115/230 V AC) PFC or non-PFC power supply
❑ Active PFC 220V for EMEA and China
❑ Non-PFC 110V and 220V with select switch.
❑ Active PFC 220V with Energy Star 5.0

# Dimension and weight

❑ Dimension (LxWxH)
  - X3400: 367.8 x 100 x 281.5 mm (with bezel)
  - X5400: 367.8 x 100 x 281.5 mm (with bezel)

- ❑ Weight (estimate)
  - ❧ X3950: ≥ 8 kg
  - ❧ X5950: ≥ 8 kg

# System Components

This section is a virtual tour of the system's interior and exterior components.

## Front Panel

### X3400



| No. | Icon | Component |
|-----|------|-----------|
| 1 | | USB 2.0 ports |
| 2 | | |
| 3 | | Front I/O cover |
| 4 | 🎤 | Microphone-in jack |
| 5 | 🎧 | Headphone/Speaker-out/line-out jack |
| 6 | ⬧ | CF I/II (CompactFlash Type I/II) slot |
| 7 | SD xD PRO | Media card reader |
| 8 | ⏏ | Drive bay door eject button<br>Press to open drive bay door and access the optical drive. |
| 9 | | Optical drive bay door |
| 10 | | HDD activity indicator |
| 11 | | Power button/power indicator |

## X5400



| No. | Icon | Component |
|-----|------|-----------|
| 1 |  | USB 2.0 ports |
| 2 |  | |
| 3 |  | Front I/O cover |
| 4 | 🎤 | Microphone-in jack |
| 5 | 🎧 | Headphone/Speaker-out/line-out jack |
| 6 | ◈ | CF I/II (CompactFlash Type I/II) slot |
| 7 | SD xD PRO M | Media card reader |
| 8 | ▲ | Drive bay door eject button<br>Press to open drive bay door and access the optical drive. |
| 9 |  | Optical drive bay door |
| 10 |  | HDD activity indicator |
| 11 | ⏻ | Power button/power indicator |

# Rear Panel

## X3400



| No. | Icon | Component |
|-----|------|-----------|
| 1 | ((⋅⋗)) | Audio in or side speaker jack |
| 2 | ⊲((⋅)) | Center speaker/subwoofer jack |
| 3 | 品 | Gigabit LAN port (10/100/1000 Mbps) |
| 4 | | USB 2.0 ports |
| 5 | | Key hole |
| 6 | | Lock slot |
| 7 | | Power connector |
| 8 | | Power supply (Photo shows PFC power supply) |
| 9 | 🖯 | PS2 mouse port |
| 10 | ⌨ | PS2 keyboard port |
| 11 | | HDMI port |
| 12 | ▭ | VGA monitor port |
| 13 | | eSATA port |
| 14 | ⊲((⋅)) | Rear speaker/surround out jack |
| 15 | ⬍ | Microphone/speaker-out/line-in jack |
| 16 | ⊲((⋅)) | Line-out jack |
| 17 | | Expansion slot (Photo shows graphics card and TV tuner card) |

# X5400



| No. | Icon | Component |
|-----|------|-----------|
| 1 | ((•)) | Audio in or side speaker jack |
| 2 | ((•)) | Center speaker/subwoofer jack |
| 3 | 品 | Gigabit LAN port (10/100/1000 Mbps) |
| 4 | | USB 2.0 ports |
| 5 | | Key hole |
| 6 | | Lock slot |
| 7 | | Power connector |
| 8 | | Power supply (Photo shows PFC power supply) |
| 9 | 🖱 | PS2 mouse port |
| 10 | ⌨ | PS2 keyboard port |
| 11 | | HDMI port |
| 12 | ▢ | VGA monitor port |
| 13 | | eSATA port |
| 14 | ((•)) | Rear speaker/surround out jack |
| 15 | ✎ | Microphone/speaker-out/line-in jack |
| 16 | ((•)) | Line-out jack |
| 17 | | Expansion slot (Photo shows graphics card and TV tuner card) |

# Internal Components
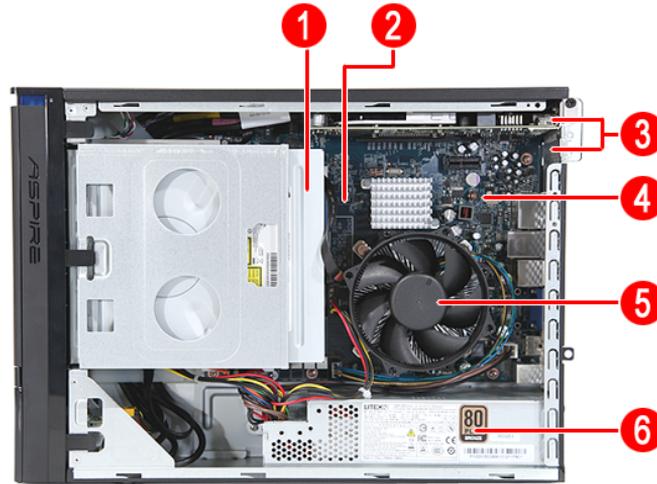


| No. | Component |
|-----|-----------|
| 1 | Optical drive |
| 2 | Memory |
| 3 | Expansion card |
| 4 | Mainboard |
| 5 | Heatsink fan assembly |
| 6 | Power supply |

# System LED Indicators

This section describes the different system LED indicators.

| LED indicator | Color | LED status | Description |
|---|---|---|---|
| Power | Blue | On | S0/S1 state |
| | Blue | Blinking | S3 state |
| | — | Off | S4/S5 state |
| HDD activity | Blue | Blinking | S0/S1 state |
| LAN activity | Blue | Blinking | S0/S1 state |
| LAN port network speed LED (left) | Amber | On | 1000 Mbps link network access |
| | Green | On | 100 Mbps link network access |
| | — | Off | 10 Mbps link network access |
| LAN port network connection LED (right) | Green | On | Active network link |
| | | Blinking | Ongoing network data activity |
| | | Off | Off-line network |

# System Utilities

## CMOS Setup Utility

CMOS setup is a hardware configuration program built into the system ROM, called the complementary metal-oxide semiconductor (CMOS) Setup Utility. Since most systems are already properly configured and optimized, there is no need to run this utility.  You will need to run this utility under the following conditions.

❑    When changing the system configuration settings

❑    When redefining the communication ports to prevent any conflicts

❑    When modifying the power management configuration

❑    When changing the password or making other changes to the security setup

❑    When a configuration error is detected by the system and you are prompted ("Run Setup" message) to make changes to the CMOS setup

**NOTE:** If you repeatedly receive Run Setup messages, the battery may be bad. In this case, the system cannot retain configuration values in CMOS. Ask a qualified technician for assistance.

CMOS setup loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM which allows configuration data to be retained when power is turned off.

Before you run the *CMOS* Setup Utility, make sure that you have saved all open files. The system reboots immediately after you close the Setup.

**NOTE:** *CMOS* Setup Utility will be simply referred to as "BIOS", "Setup", or "Setup utility" in this guide.

The screenshots used in this guide display default system values. These values may not be the same those found in your system.

# Entering CMOS setup

1.  Turn on the computer and the monitor.

    If the computer is already turned on, close all open applications, then restart the computer.

2.  During POST, press **Delete**.

    If you fail to press **Delete** before POST is completed, you will need to restart the computer.

    The Setup Main menu will be displayed showing the Setup's menu bar. Use the left and right arrow keys to move between selections on the menu bar.

# Navigating Through the Setup Utility

Use the following keys to move around the Setup utility.

❏ **Left** and **Right** arrow keys – Move between selections on the menu bar.

❏ **Up** and **Down** arrow keys – Move the cursor to the field you want.

❏ **PgUp** and **PgDn** keys – Move the cursor to the previous and next page of a multiple page menu.

❏ **Home** – Move the cursor to the first page of a multiple page menu.

❏ **End** – Move the cursor to the last page of a multiple page menu.

❏ **+** and **-** keys – Select a value for the currently selected field (only if it is user-configurable). Press these keys repeatedly to display each possible entry, or the **Enter** key to choose from a pop-up menu.

**NOTE:** Grayed-out fields are not user-configurable.

❏ **Enter** key – Display a submenu screen.

**NOTE:** Availability of submenu screen is indicated by a (>).

❏ **Esc** – If you press this key:

  ❏ On one of the primary menu screens, the Exit menu displays.

  ❏ On a submenu screen, the previous screen displays.

  ❏ When you are making selections from a pop-up menu, closes the pop-up without making a selection.

❏ **F1** – Display the General Help panel.

❏ **F9** – Press to load optimized default system values.

❏ **F10** – Save changes made the Setup and close the utility.

# Setup Utility Menus

```
        CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.

  ►  Product Information          ►  PC Health Status

  ►  Standard CMOS Features       ►  Frequency/Voltage Control

  ►  Advanced BIOS Features       ►  BIOS Security Features

  ►  Advanced Chipset Features        Load Default Settings

  ►  Integrated Peripherals          Save & Exit Setup

  ►  Power Management Setup           Exit Without Saving


  ↑↓←→ :Move        Enter:Select            +/−/:Value              ESC:Exit
       F1:General Help          F9:Optimized Defaults          F10:Save

            v02.66  (C)Copyright  1985-2009,  American  Megatrends,  Inc.
```

The Setup Main menu includes the following main setup categories.

- ❏  Product Information
- ❏  Standard CMOS Features
- ❏  Advanced BIOS Features
- ❏  Advanced Chipset Features
- ❏  Integrated Peripherals
- ❏  Power Management Setup
- ❏  PC Health Status
- ❏  Frequency/Voltage Control
- ❏  BIOS Security Features
- ❏  Load Default Settings
- ❏  Save & Exit Setup
- ❏  Exit Without Saving

In the descriptive table following each of the menu screenshots, settings in **boldface** are the default and suggested settings.

# Product Information

The Product Information menu displays basic information about the system. These entries are for your reference only and are not user-configurable.

```
CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                           Product Information

Processor Type          :                          |  Help Item
AMD Phenom(TM) II X4 810 Processor
Processor Speed         :2.60GHz
System Memory           :1792MB
System Manufacturer     :xxxxxxxx
Product Name            :xxxxxxxx
System Serial Number    :
System BIOS Version     :P01-B0
BIOS Release Date       :xxxxxxxxxx
Asset Tag Number        :




↑↓←→:Move        Enter:Select        +/-/:Value          ESC:Exit
     F1:General Help         F9:Optimized Defaults       F10:Save
```

| Parameter | Description |
|-----------|-------------|
| Processor Type | Type of processor installed on the system. |
| Processor Speed | Speed of the processor installed on the system. |
| System Memory | Total size of system memory installed on the system. |
| System Manufacturer | Manufacturer of the system. |
| Product Name | Product name of the system. |
| System Serial Number | Serial number of the system. |
| System BIOS Version | Version number of the BIOS setup utility. |
| BIOS Release Date | Date when the BIOS setup utility was released |
| Asset Tag Number | Asset tag number of this system. |

# Standard CMOS Features

```
CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                        Standard CMOS Features

System Date              [Thu 04/02/2010]           Help Item
System Time              [21:26:38]
                                              Use [ENTER] , [TAB]
 ► AHCI Port 1           [Hard Disk]          or [SHIFT-TAB] to
 ► AHCI Port 2           [Not Detected]       select a field.
 ► AHCI Port 3           [Not Detected]
 ► AHCI Port 4           [Not Detected]       Use [+] or [-] to
                                              configure system Date.
 Halt on                 [All, but keyboard]




 ↑↓←→ :Move        Enter:Select          +/-/:Value           ESC:Exit
     F1:General Help         F9:Optimized Defaults        F10:Save
```

| Parameter | Description | Option |
|-----------|-------------|--------|
| System Date | Set the date following the weekday-month-day-year format. | |
| System Time | Set the system time following the hour-minute-second format. | |
| AHCI Port 1/2/3/4 | Displays the status of auto detection of the AHCI device. | |
| Halt On | Determines whether the system will stop for an error during the POST. | **All, but keyboard** <br> No Errors <br> All Errors |

# Advanced BIOS Features

```
          CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                              Advanced BIOS Features

   Quick Boot                    [Enabled]              Help Item
   Quiet Boot                    [Disabled]
   1st Boot device               [Hard Drive]      Allows BIOS to skip
   2nd Boot device               [CD/DVD]          certain tests while
   3rd Boot device               [Removable Dev.]  booting. This will
   4th Boot device               [Network]         decrease the time
   ► Hard Disk Drive Priority    [Press Enter]     needed to boot the
   ► Optical Disk Drive Priority [Press Enter]     system.
   ► Removable Device Priority   [Press Enter]
   ► Network Device Priority     [Press Enter]
   Bootup Num-Lock               [On]
   USB Beep Message              [Disabled]




   ↑↓←→ :Move        Enter:Select           +/-/:Value          ESC:Exit
        F1:General Help       F9:Optimized Defaults       F10:Save
```
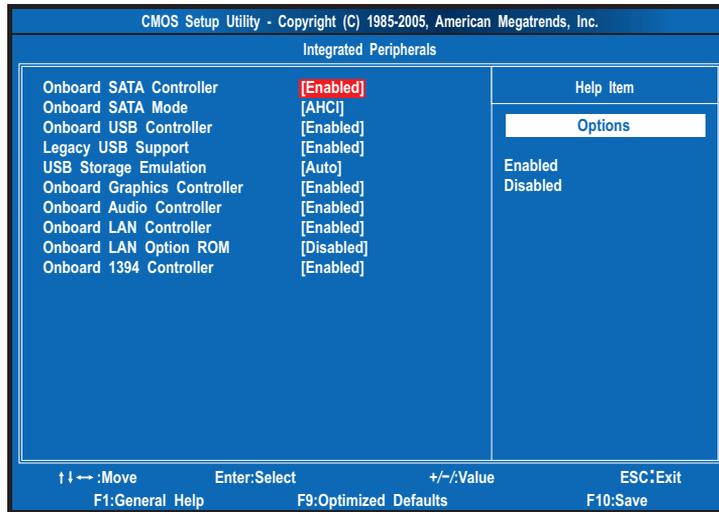
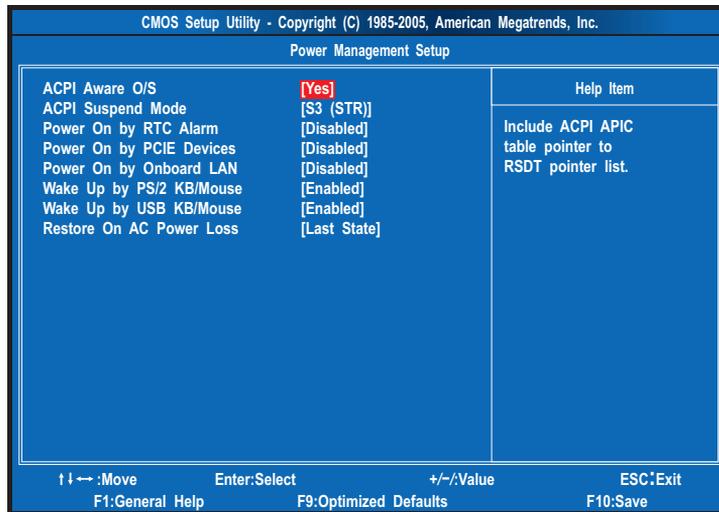| Parameter | Description | Option |
|---|---|---|
| Quick Boot | Allows you to decrease the time it takes to boot the computer by shortening or skipping certain standard booting process. | **Enabled** <br> Disabled |
| Quiet Boot | When enabled, the BIOS splash screen displays during startup. <br> When disabled, the diagnostic screen displays during startup. | Enabled <br> **Disabled** |
| 1st/2nd/3rd/4th Boot Device | Specifies the boot order from the available devices. | Hard Disk <br> CD/DVD <br> Removable Dev. <br> LAN |
| Hard Disk Drive Priority | Press **Enter** to access the Hard Disk Drive Priority submenu and specify the boot device priority sequence from available hard drives. | |
| Optical Disk Drive Priority | Press **Enter** to access the Optical Disk Drive Priority submenu and specify the boot device priority sequence from available CD/DVD drives. | |
| Removable Device Priority | Press **Enter** to access the Removable Device Priority submenu and specify the boot device priority sequence from available removable drives. | |
| Network Device Priority | Press **Enter** to access the Network Device Priority submenu and specify the boot sequence from available network devices. | |
| Bootup Num-Lock | Selects power on state for Num Lock. | **On** <br> Off |
| USB Beep Message | Enables or disables BIOS to display error beeps or messages during USB device enumeration. | **Disabled** <br> Enabled |

# Advanced Chipset Features



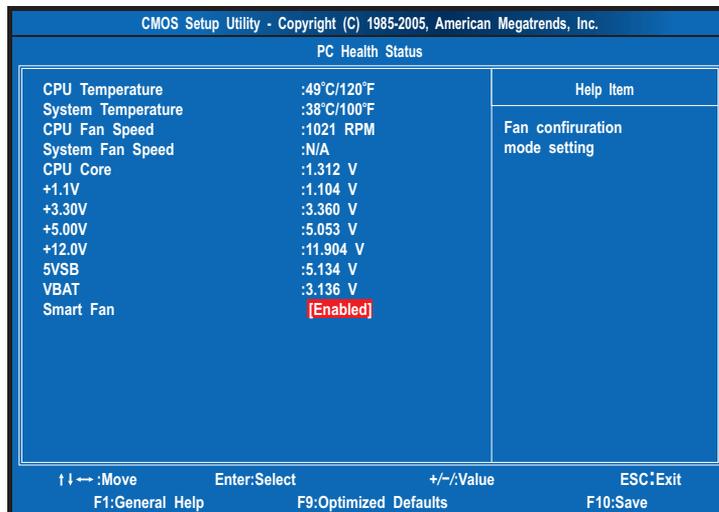| Parameter | Description | Option |
|---|---|---|
| AMD Cool'n'Quiet | Enables or disables the generation of ACPI_PPC, PPS, and PCT objects. | **Enabled**<br>Disabled |
| AMD-V | Enables or disables the AMD Virtualization Technology (VT) availability. | **Enabled**<br>Disabled |
| Memory Hole Remapping | Enables or disables remapping of overlapped PCI memory above the total physical memory. | **Enabled**<br>Disabled |
| Hybrid SLI | Enables or disables the Hybrid SLI Technology. | Enabled<br>**Disabled** |
| Primary Video | Select a graphic controller as a primary boot device. | **Auto**<br>PCIE<br>Onboard VGA |
| UMA Frame Buffer Size | Select the amount of system memory used by the Intel graphics device. | **Auto**<br>32 MB<br>64 MB<br>128 MB<br>Disabled |
| Current UMA Size | Select a video memory size. | **256 MB**<br>128 MB<br>Maximum |

# Integrated Peripherals

```
          CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                                  Integrated Peripherals

   Onboard SATA Controller      [Enabled]              Help Item
   Onboard SATA Mode            [AHCI]
   Onboard USB Controller       [Enabled]              Options
   Legacy USB Support           [Enabled]
   USB Storage Emulation        [Auto]             Enabled
   Onboard Graphics Controller  [Enabled]          Disabled
   Onboard Audio Controller     [Enabled]
   Onboard LAN Controller       [Enabled]
   Onboard LAN Option ROM       [Disabled]
   Onboard 1394 Controller      [Enabled]




   ↑↓←→ :Move         Enter:Select           +/~/:Value           ESC:Exit
        F1:General Help        F9:Optimized Defaults         F10:Save
```

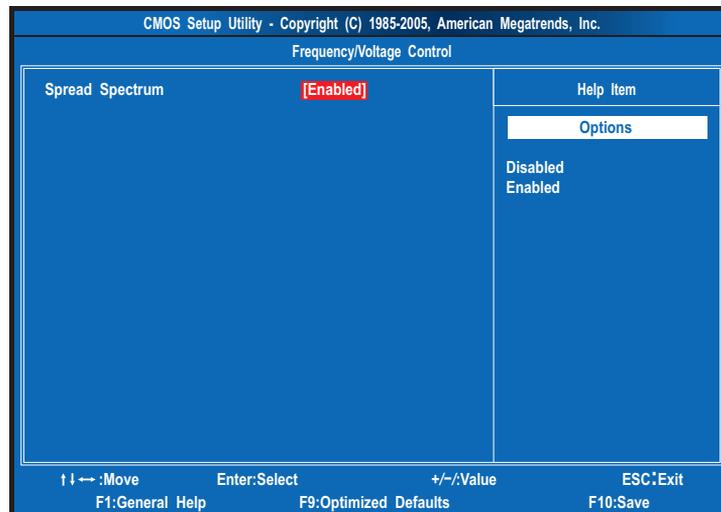| Parameter | Description | Option |
|-----------|-------------|--------|
| Onboard SATA Controller | Enables or disables the onboard SATA controller. | **Enabled** Disabled |
| Onboard SATA Mode | Select an operating mode for the onboard SATA. | **AHCI** Native IDE |
| Onboard USB Controller | Enables or disables the onboard USB controller. | **Enabled** Disabled |
| Legacy USB Support | Enables or disables support for legacy USB devices. | **Enabled** Disabled |
| USB Storage Emulation | When set to Auto, USB devices less than 2 GB will be emulated as Floppy and remaining as HDD. Forced HDD option can be used to force a HDD formatted drive to boot as FDD. | **Auto** Floppy Hard Disk |
| Onboard Graphics Controller | Enables or disables the onboard graphics controller. | Enabled **Disabled** |
| Onboard Audio Controller | Enabled or disables the onboard audio controller. | **Enabled** Disabled |
| Onboard LAN Controller | Enables or disables the onboard LAN controller. | **Enabled** Disabled |
| Onboard LAN Option ROM | Enables or disables the load of embedded option ROM for onboard network controller. | Enabled **Disabled** |
| Onboard 1394 Controller | Enables or disables the onboard 1394 controller. | **Enabled** Disabled |

# Power Management Setup



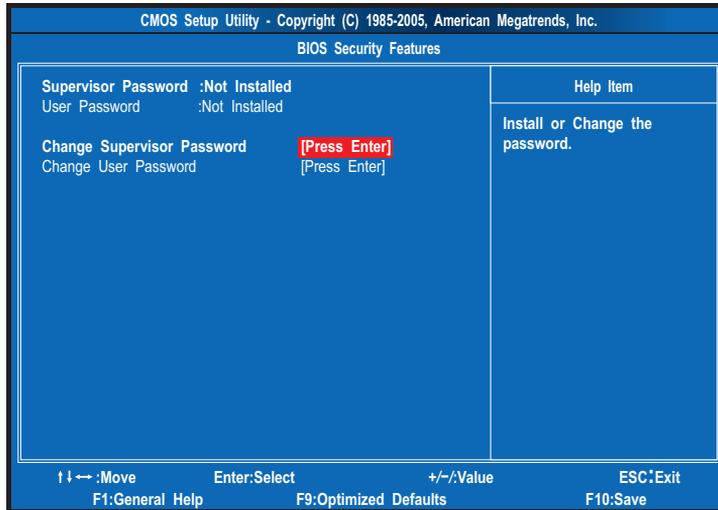| Parameter | Description | Option |
|---|---|---|
| ACPI Aware O/S | Enables or disables the Advanced Configuration and Power Management (ACPI) function. | **Yes**<br>Disabled |
| ACPI Suspend Mode | Select an ACPI state. | **S3 (STR)**<br>S1 (POS) |
| Power On by RTC Alarm | Enables or disables real time clock (RTC) to generate a wake event. | Enabled<br>**Disabled** |
| Power On by PCIE Devices | Enables or disables to wake up the system from a power saving mode through an event on PCI Express device. | Enabled<br>**Disabled** |
| Power On by Onboard LAN | Enables or disables an onboard LAN controller to generate a wake event. | Enabled<br>**Disabled** |
| Wake Up by PS/2 KB/Mouse | Enables or disables to wake up the system from a power saving mode using a PS2 keyboard or mouse. | **Enabled**<br>Disabled |
| Wake Up by USB KB/Mouse | Enables or disables to wake up the system from a power saving mode using a USB keyboard or mouse. | **Enabled**<br>Disabled |
| Restore On AC Power Loss | Enables or disables the system to reboot after a power failure or interrupt occurs. | Power Off<br>Power On<br>**Last State** |

# PC Health Status

```
        CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                                   PC Health Status

   CPU  Temperature              :49°C/120°F              Help Item
   System  Temperature           :38°C/100°F
   CPU Fan  Speed                :1021 RPM          Fan  confiruration
   System  Fan  Speed            :N/A               mode  setting
   CPU  Core                     :1.312  V
   +1.1V                         :1.104  V
   +3.30V                        :3.360  V
   +5.00V                        :5.053  V
   +12.0V                        :11.904 V
   5VSB                          :5.134  V
   VBAT                          :3.136  V
   Smart  Fan                    [Enabled]




   ↑↓←→ :Move        Enter:Select         +/-/:Value           ESC:Exit
        F1:General  Help          F9:Optimized  Defaults        F10:Save
```

| Parameter | Description | Option |
|-----------|-------------|--------|
| Smart Fan | Enables or disables the smart system fan control function. | **Enabled**<br>Disabled |

# Frequency/Voltage Control

```
        CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                           Frequency/Voltage Control

    Spread Spectrum              [Enabled]                    Help Item

                                                        ┌──────────────────┐
                                                        │     Options      │
                                                        └──────────────────┘
                                                         Disabled
                                                         Enabled









    ↑↓←→ :Move          Enter:Select            +/~/:Value           ESC:Exit
         F1:General Help          F9:Optimized Defaults       F10:Save
```

| Parameter | Description | Option |
|-----------|-------------|--------|
| Spread Spectrum | Enables or disables the reduction of the mainboard's EMI. <br><br>**Note:** Remember to disable the Spread Spectrum feature if you are overclocking. A slight jitter can introduce a temporary boost in clock speed causing the overclocked processor to lock up. | **Enabled** <br> Disabled |

# BIOS Security Features

```
CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
                         BIOS Security Features

 Supervisor Password  :Not Installed                        Help Item
 User  Password        :Not  Installed
                                                    Install or Change the
 Change  Supervisor  Password      [Press  Enter]   password.
 Change  User  Password             [Press  Enter]




 ↑↓ ←→ :Move        Enter:Select          +/−/:Value           ESC:Exit
          F1:General  Help        F9:Optimized  Defaults       F10:Save
```

| Parameter | Description |
|---|---|
| Supervisor Password | Indicates the status of the supervisor password. |
| User Password | Indicates the status of the user password. |
| Change Supervisor Password | Supervisor password prevents unauthorized access to the BIOS Setup Utility. Press **Enter** to change the Supervisor password. |
| Change User Password | Press **Enter** to change the User password. |

### Setting a system password

1. Use the up/down arrow keys to select a password parameter (Change Supervisor Password or Change User Password) menu then press **Enter**.

   A password box will appear.

2. Type a password then press **Enter**.

   The password may consist up to six alphanumeric characters (A-Z, a-z, 0-9)

3. Retype the password to verify the first entry then press **Enter** again.

4. Press **F10**.

5. Select **Yes** to save the new password and close the Setup Utility.

### Changing the system password

1. Use the up/down arrow keys to select password parameter (Change Supervisor Password or Change User Password) menu then press **Enter**.

2. Type the original password then press **Enter**.

3. Type a new password then press **Enter**.

4. Retype the password to verify the first entry then press **Enter** again.

5. Press **F10**.

6. Select **Yes** to save the new password and close the Setup Utility.

### Removing a system password

1. Use the up/down arrow keys to select password parameter (Change Supervisor Password or Change User Password) menu then press **Enter**.

2. Enter the current password then press **Enter**.

3. Press **Enter** twice without entering anything in the password fields.
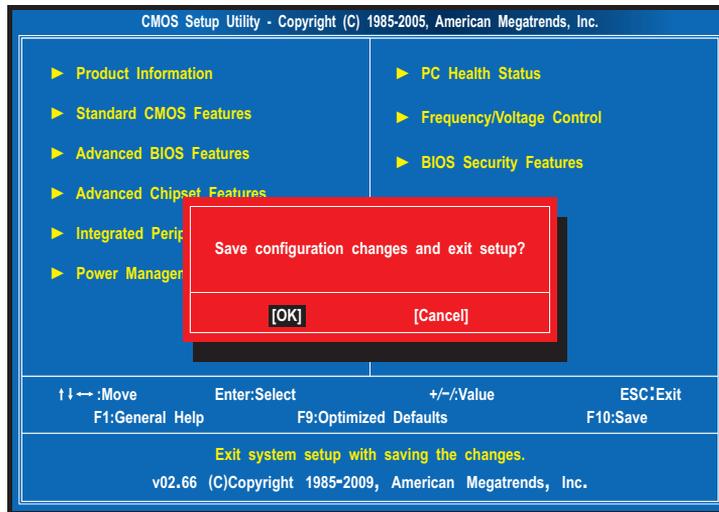
# Load Default Settings

The Load Default Settings menu allows you to load the default settings for all BIOS setup parameters. Setup defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.
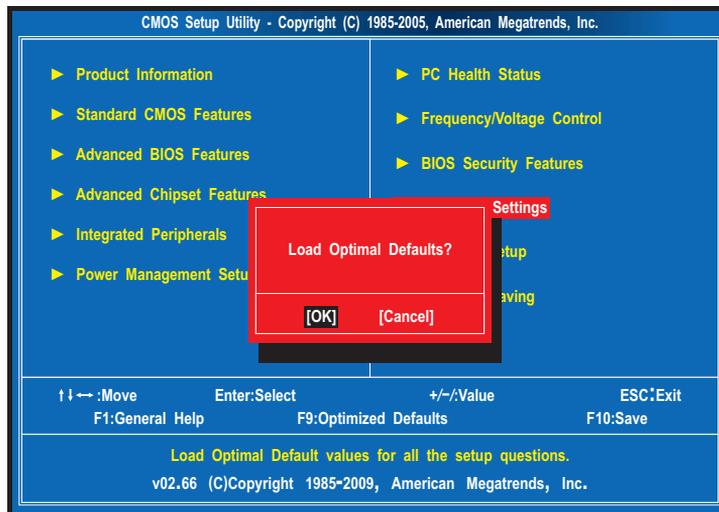
# Save & Exit Setup

The Save & Exit Setup menu allows you to save changes made and close the Setup Utility.

| CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc. | |
|---|---|
| ► Product Information | ► PC Health Status |
| ► Standard CMOS Features | ► Frequency/Voltage Control |
| ► Advanced BIOS Features | ► BIOS Security Features |
| ► Advanced Chipset Features | |
| ► Integrated Perip | Save configuration changes and exit setup? |
| ► Power Manager | |
| | [OK]          [Cancel] |

↑↓←→ :Move     Enter:Select     +/~/:Value     ESC:Exit
F1:General Help     F9:Optimized Defaults     F10:Save

Exit system setup with saving the changes.

v02.66 (C)Copyright 1985-2009, American Megatrends, Inc.

# Exit Without Saving

The Exit Without Saving menu allows you to discard changes made and close the Setup Utility.



```
          CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.

      ►  Product Information              ►  PC Health Status

      ►  Standard CMOS Features           ►  Frequency/Voltage Control

      ►  Advanced BIOS Features           ►  BIOS Security Features

      ►  Advanced Chipset Features
                          ┌─────────────────────────────────────┐
      ►  Integrated Periphera             Discard changes and exit setup?

      ►  Power Management
                              [OK]              [Cancel]
                          └─────────────────────────────────────┘

    ↑↓ ←→ :Move          Enter:Select          +/~/:Value          ESC:Exit
       F1:General Help          F9:Optimized Defaults          F10:Save

                   Exit system setup without saving the changes.
             v02.66  (C)Copyright  1985-2009,  American  Megatrends,  Inc.
```

# System Disassembly

This chapter contains step-by-step procedures on how to disassemble the desktop computer for maintenance and troubleshooting.

## Disassembly Requirements

To disassemble the computer, you need the following tools:

❏    Wrist grounding strap and conductive mat for preventing electrostatic discharge

❏    Flat-blade screwdriver

❏    Philips screwdriver

❏    Hex screwdriver

❏    Plastic flat-blade screwdriver

❏    Plastic tweezers

**NOTE:** The screws for the different components vary in size. During the disassembly process, group the screws with the corresponding components to avoid mismatch when putting back the components.

# Pre-disassembly Procedure

Before proceeding with the disassembly procedure, perform the steps listed below:

1.  Turn off the system and all the peripherals connected to it.
2.  Unplug the power cord from the power outlets.
3.  Unplug the power cord from the system.
4.  Unplug all peripheral cables from the system.
5.  Place the system unit on a flat, stable surface.

# Main Unit Disassembly

X3400

**MAIN UNIT DISASSEMBLY**

```
┌─────────────────┐
│   MAIN  UNIT    │
└─────────────────┘
         │ Ax2
         ▼
┌─────────────────┐
│   SIDE PANEL    │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  FRONT BEZEL    │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  HEATSINK FAN   │
│    ASSEMBLY     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│   PROCESSOR     │
└─────────────────┘
         │ Cx2                         Bx2
         ▼                    ┌─────────────────┐
┌─────────────────┐     ┌───▶│  OPTICAL DISK   │
│ HDD-ODD BRACKET │─────┤    │     DRIVE       │
└─────────────────┘     │    └─────────────────┘
         │ Ax3, Bx1     │              Dx4
         ▼              │    ┌─────────────────┐        ┌─────────┐
┌─────────────────┐     └───▶│   HDD MODULE    │───────▶│   HDD   │
│  POWER SUPPLY   │          └─────────────────┘        └─────────┘
└─────────────────┘
         │
         ▼
┌─────────────────┐                     Ax1
│ MEMORY MODULES  │          ┌─────────────────┐
└─────────────────┘          │ TV TUNER CARD   │
         │              ┌───▶│       or        │
         ▼              │    │ NETWORK CARD    │
┌─────────────────┐     │    │       or        │
│    PCI CARD     │─────┤    │ GRAPHICS CARD   │
└─────────────────┘     └───▶└─────────────────┘
         │ Bx1                          Bx2
         ▼                    ┌─────────────────┐
┌─────────────────┐     ┌───▶│ FRONT I/O BOARD │
│ FRONT I/O AND   │─────┤    └─────────────────┘
│CARD READER BOARD│     │              Bx2
│    BRACKET      │     │    ┌─────────────────┐
└─────────────────┘     └───▶│  CARD READER    │
         │ Bx6               │     BOARD       │
         ▼                   └─────────────────┘
┌─────────────────┐
│   MAINBOARD     │
└─────────────────┘
```

## X5400

**MAIN UNIT DISASSEMBLY**

```
┌─────────────────┐
│   MAIN  UNIT    │
└─────────────────┘
         │ Ax2
         ▼
┌─────────────────┐
│   SIDE PANEL    │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  FRONT BEZEL    │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  HEATSINK FAN   │
│    ASSEMBLY     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│   PROCESSOR     │
└─────────────────┘
         │ Cx2                        Bx2
         ▼                  ┌─────────────────┐
┌─────────────────┐ ───────►│  OPTICAL DISK   │
│ HDD-ODD BRACKET │         │     DRIVE       │
└─────────────────┘         └─────────────────┘
         │ Ax3, Bx1                   Dx4
         │                  ┌─────────────────┐    ┌─────────┐
         │          ───────►│   HDD MODULE    │───►│   HDD   │
         ▼                  └─────────────────┘    └─────────┘
┌─────────────────┐
│  POWER SUPPLY   │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ MEMORY MODULES  │
└─────────────────┘
         │                            Ax1
         ▼                  ┌─────────────────┐
┌─────────────────┐         │ TV TUNER CARD   │
│    PCI CARD     │ ───────►│      or         │
└─────────────────┘         │  NETWORK CARD   │
         │                  │      or         │
         │                  │  GRAPHICS CARD  │
         │                  └─────────────────┘
         │ Bx1                        Bx2
         ▼                  ┌─────────────────┐
┌─────────────────┐ ───────►│ FRONT I/O BOARD │
│ FRONT I/O AND   │         └─────────────────┘
│ CARD READER     │                   Bx2
│ BOARD BRACKET   │         ┌─────────────────┐
└─────────────────┘ ───────►│  CARD READER    │
         │ Bx6              │     BOARD       │
         ▼                  └─────────────────┘
┌─────────────────┐
│   MAINBOARD     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│   TOP BEZEL     │
└─────────────────┘
```

## Screw List

| Code | Screw | Part No. |
|------|-------|----------|
| A | #6-32 L5 BZN | 86.00J07.B60 |
| B | M3xL5 BZN | 86.1A324.5R0 |
| C | #6-32*3/16 NI | 86.5A5B6.012 |
| D | #6-32 L6 NI | 86.00J44.C60 |

# Removing the Side Panel

1. Perform the pre-disassembly procedure described on page 28.
2. Remove the two screws (A) located on the rear edge of the side panel.

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| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L5 BZN (2) | Black | 5.7 to 6.3 kgf-cm | 86.00J07.B60 |

3. Slide the side panel toward the back of the chassis until the tabs on the cover disengage with the slots on the chassis.
4. Lift the side panel away from the system and put it aside for reinstallation later.

X3400                                        X5400

# Removing the Front Bezel

1.   Remove the side panel. Refer to the previous section for instructions.

2.   Remove the front bezel according to machine model.

**NOTE:** To remove the X3400 model's front bezel, you must first release the tabs securing the front bezel and disconnect the LED cable, located under the front bezel, from the mainboard.

If the LED cable is secured in the retaining clip, you must remove the HDD-ODD bracket prior to removing the front bezel. To remove the HDD-ODD bracket, see page 36.

**(1).** Release the front bezel retention tabs from the unit interior.

**(2).** For the X3400 model, rotate the bezel, then proceed to the next step to remove the front bezel. For the X5400 model, pull the bezel off the unit.
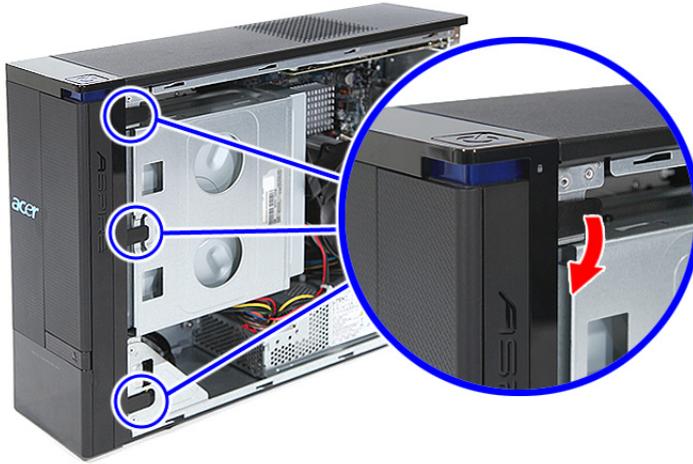


X3400
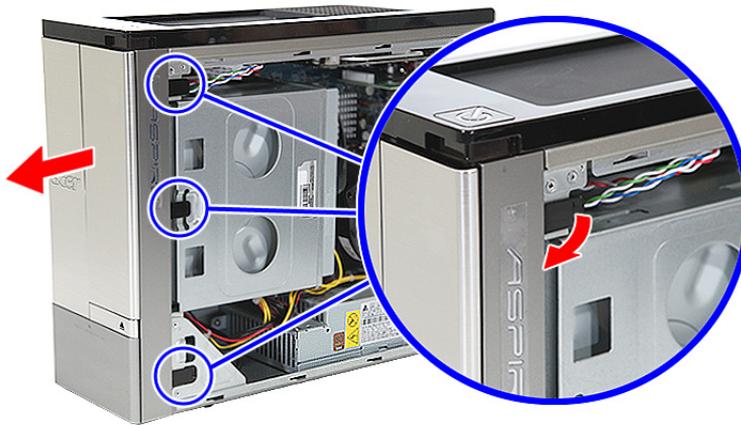


X5400

**(3).** Disconnect the LED cable from the mainboard, then insert the cable into the hole on the housing and remove the bezel.

X3400

# Removing the Heatsink Fan Assembly

**WARNING:** The heatsink becomes very hot when the system is on. NEVER touch the heatsink with any metal or with your hands.

1. See "Removing the Side Panel" on page 31.

2. Use a long-nosed screwdriver to loosen the four screws on the heatsink fan assembly.



X3400                                                    X5400

3. Lift the heatsink fan assembly off the mainboard.
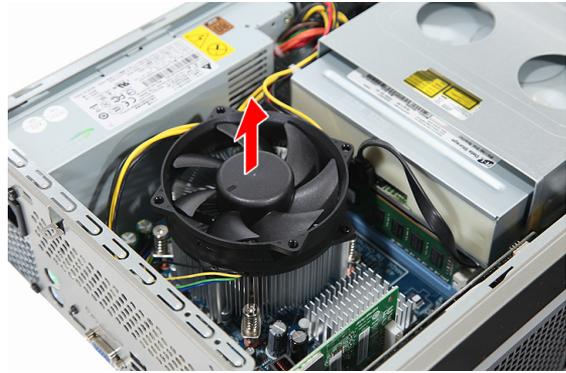


X3400                                                    X5400

4. Lay it down in an upright position—with the thermal patch facing upward, on top of the optical drive then disconnect the fan cable from its mainboard connector. Do not let the thermal patch on the heat sink fan assembly touch the work surface.



5. Use an alcohol pad to wipe off the thermal grease from both the heat sink and the processor.

# Removing the Processor

**IMPORTANT:** Before removing a processor from the mainboard, make sure to create a backup file of all important data.

**WARNING:** The processor becomes very hot when the system is on. Allow it to cool off first before handling.

1. See "Removing the Side Panel" on page 31.
2. See "Removing the Heatsink Fan Assembly" on page 34.
3. Release the load lever, then pull the load lever to the fully open, upright position.
4. Pull out the processor from the socket.
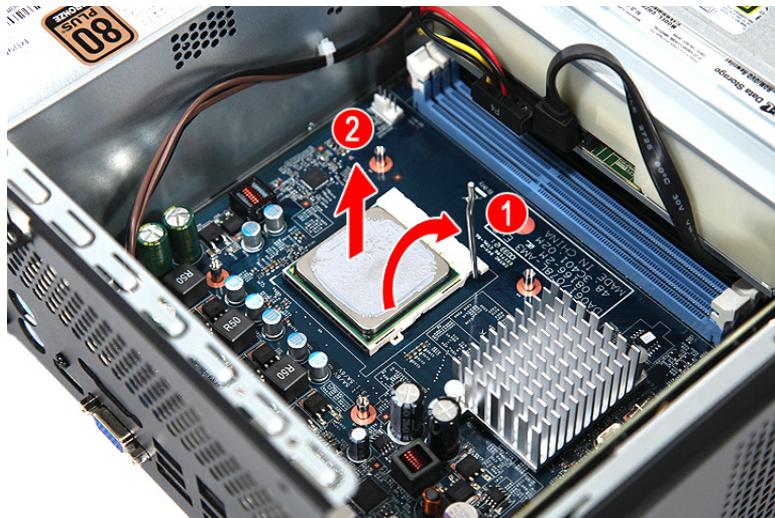


**IMPORTANT:** If you are going to install a new processor, note the arrow on the corner to make sure the processor is properly oriented over the socket.

# Removing the Optical Drive

1. See "Removing the Side Panel" on page 31.

2. See "Removing the Front Bezel" on page 32.

3. Remove the HDD-ODD bracket.

    **(1).** Disconnect the data and power cables from their optical drive connectors.



    **(2).** Remove the two screws (B) that secure the HDD-ODD bracket.



| Screw (Quantity) | Color | Torque | Part No. |
|:---:|:---:|:---:|:---:|
| 6-32 xL6 (2) | Silver | 5.7 to 6.3 kgf-cm | 86.1A324.5R0 |

**(3).** Lift the HDD-ODD bracket, then disconnect the data and power cables from their HDD connectors.
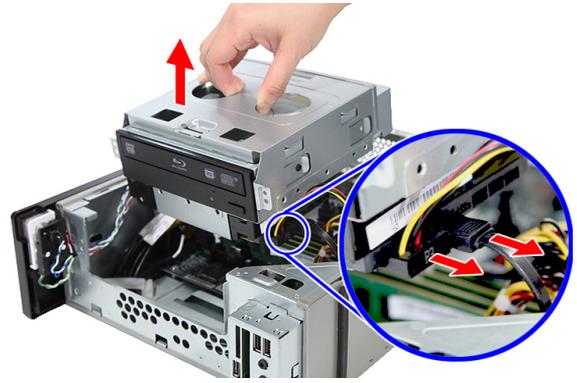


X3400                                                        X5400

**4.** Remove the two screws (B) that secure the optical drive.



| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32*3/16 NI (3 | Silver | 5.7 to 6.3 kgf-cm | 86.1A324.5R0 |

**5.** Slide the optical drive out of the bracket.

# Removing the Hard Disk Drive

1.  See "Removing the Side Panel" on page 31.

2.  See "Removing the Front Bezel" on page 32.

3.  See "Remove the HDD-ODD bracket." on page 36.

    **(1).** Place the bracket on a clean, static-free work surface.

    **(2).** Remove the four screws (C) that secure the HDD module.
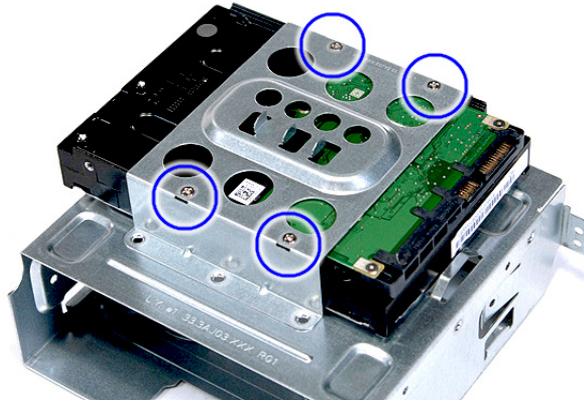
| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32*3/16 NI (4) | Silver | 5.7 to 6.3 kgf-cm | 86.5A5B6.012 |

    **(3).** Slide the HDD out of the bracket.
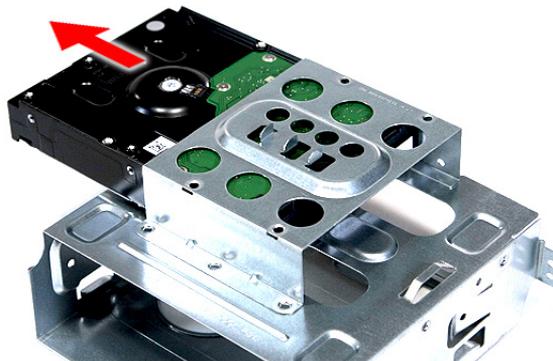
# Removing the Power Supply

1.  See "Removing the Side Panel" on page 31.
2.  See "Removing the Heatsink Fan Assembly" on page 34.
3.  See "Removing the Processor" on page 35.
4.  See "Remove the HDD-ODD bracket." on page 36.
5.  Disconnect the power cables from their mainboard connectors.



6.  Remove the screw (D) that secures the power supply.
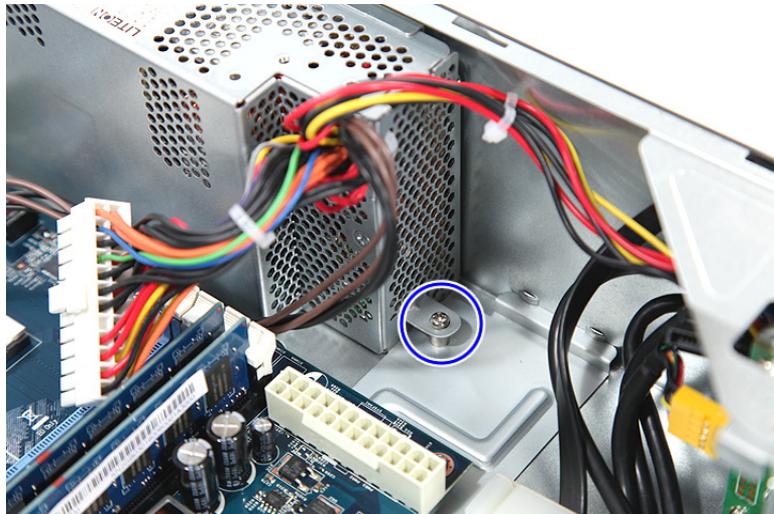


| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L6 BZN (1) | Silver | 5.7 to 6.3 kgf-cm | 86.00J44.C60 |

**7.** Remove the three screws (A) that secure the power supply module.
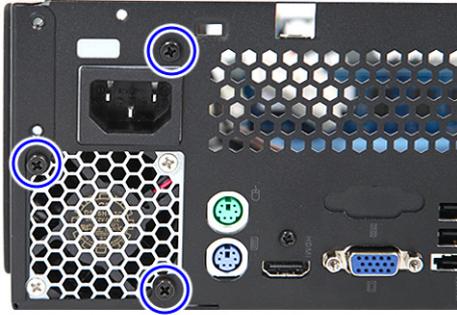


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| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L5 BZN (3) | Black | 5.7 to 6.3 kgf-cm | 86.00J07.B60 |

**8.** Lift the power supply module off the unit.
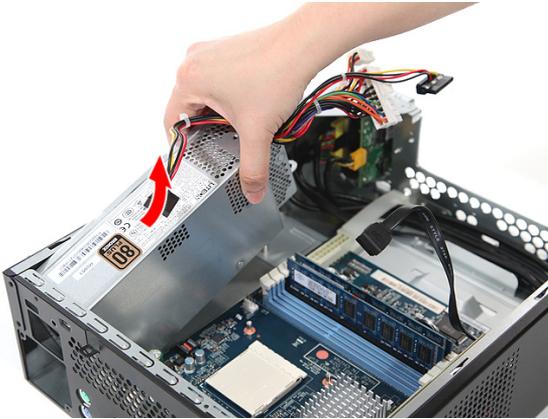


X3400
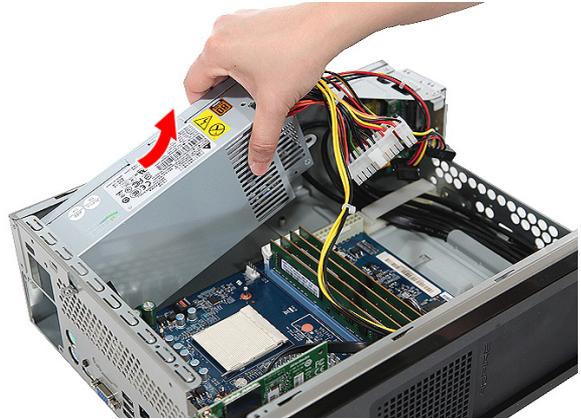


X5400

# Removing the Memory Modules

**IMPORTANT:** Before removing any DIMM, make sure to create a backup file of all important data.

1. See "Removing the Side Panel" on page 31.

2. See "Removing the Front Bezel" on page 32.

3. See "Remove the HDD-ODD bracket." on page 36.

4. Press the holding clips on both sides of the DIMM slot outward to release the DIMM.

5. Gently pull the DIMM upward to remove it from its slot.
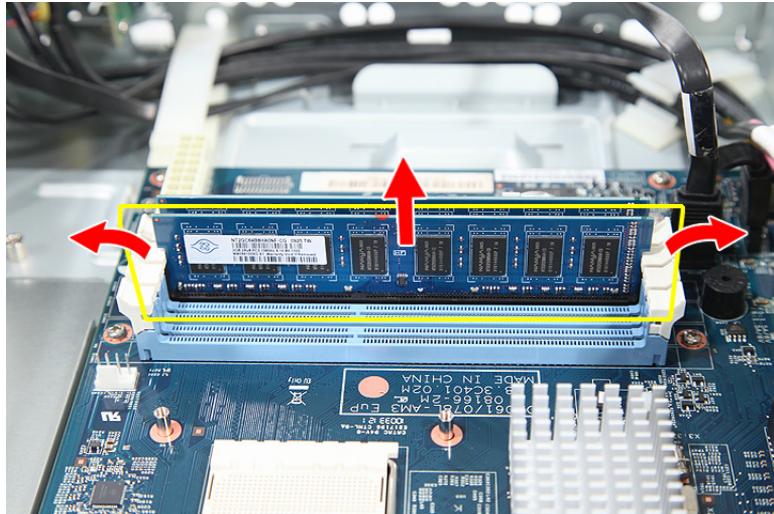


**NOTE: The DIMM has been highlighted with a yellow rectangle as above image shows. Please detach the DIMM and follow local regulations for disposal.**

6. Do the same to remove the other modules.

# Removing an Expansion Card

This section includes instructions on how to remove a TV tuner card and a VGA card.

## To remove the network card:

1.  See "Removing the Side Panel" on page 31.

2.  Remove the screw (A) that secures the card to the chassis.

| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L5 BZN (3) | Black | 5.7 to 6.3 kgf-cm | 86.00J07.B60 |

3.  Pull the card out of its mainboard connector.
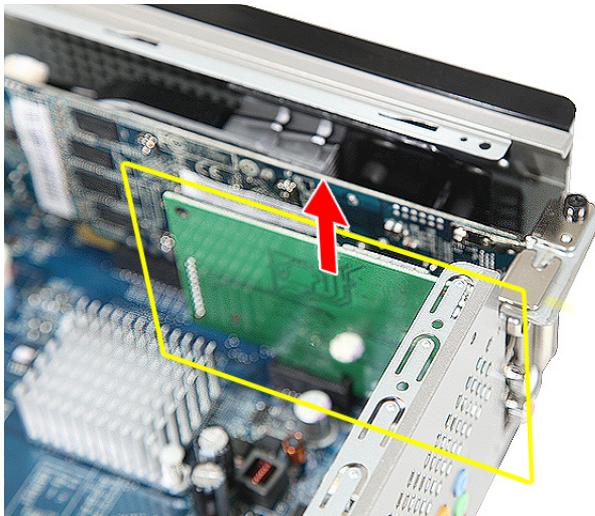
**NOTE: The card has been highlighted with a yellow rectangle as above image shows. Please detach the card and follow local regulations for disposal.**

## To remove the VGA card:

1. See "Removing the Side Panel" on page 31.
2. Remove the screw (A) that secures the card to the chassis.



| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L5 BZN (3) | Black | 5.7 to 6.3 kgf-cm | 86.00J07.B60 |

3. Pull the card out of its mainboard connector.
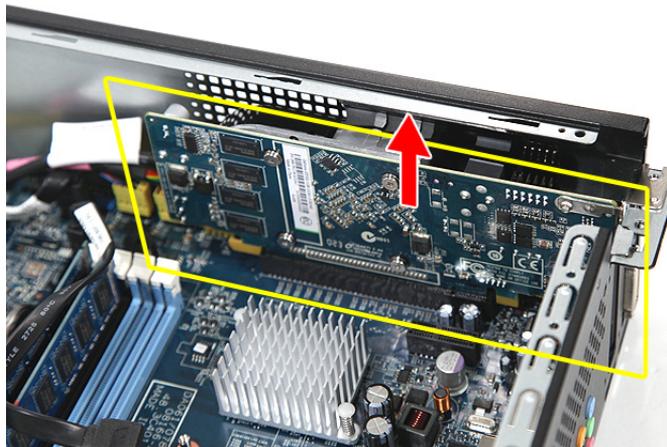


**NOTE: The card has been highlighted with a yellow rectangle as above image shows. Please detach the card and follow local regulations for disposal.**

# Removing the Front I/O and Card Reader Boards

1. See "Removing the Side Panel" on page 31.

2. See "Removing the Front Bezel" on page 32.

3. See "Remove the HDD-ODD bracket." on page 36.

4. Open the cable retention clips and disconnect the data cables from their mainboard connectors.
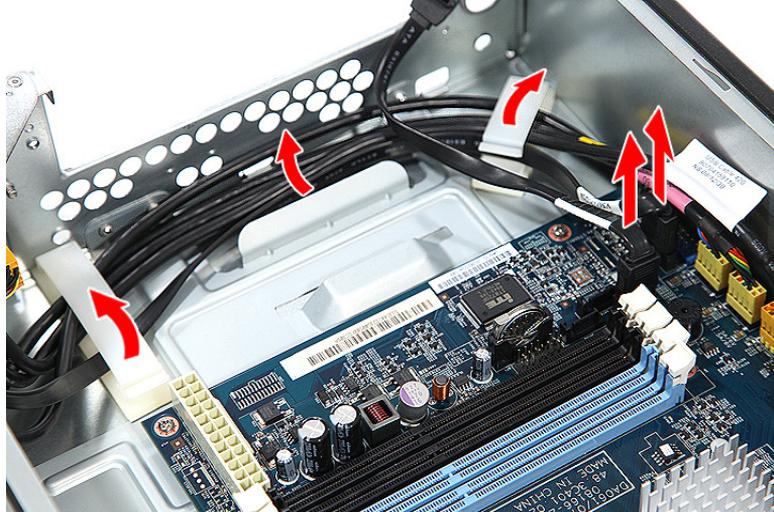
5. Disconnect the front I/O board and card reader board cables from their mainboard connectors.
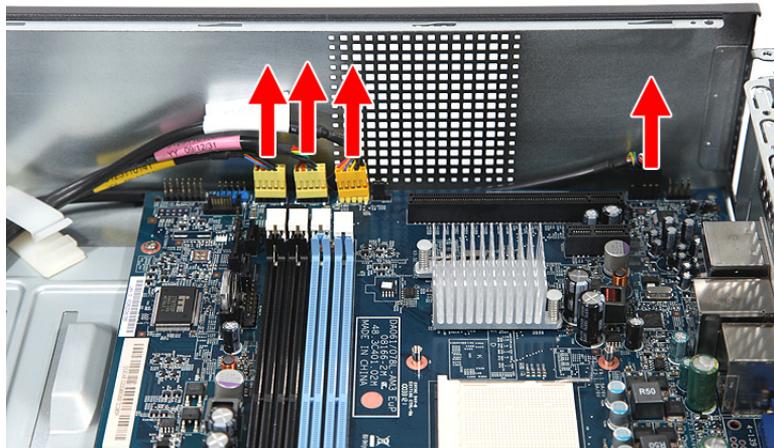
6. Remove the front I/O and card reader board bracket.

**(1).** Remove the screw (D) that secures the bracket to the chassis.



| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L6 BZN (1) | Silver | 4.75 to 5.2 kgf-cm | 86.00J44.C60 |

**(2).** Remove the bracket.



**7.** Remove the card reader board.

**(1).** Remove the two screws (D) that secure the card reader board to the bracket.



| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L6 BZN (1) | Silver | 3.8 to 4.2 kgf-cm | 86.00J44.C60 |

**(2).** Pull the card reader board out of the bracket.



NOTE: The card has been highlighted with a yellow rectangle as above image shows.
Please detach the card and follow local regulations for disposal.

**8.** Remove the front I/O board.

**(1).** Remove the two screws (D) that secure the I/O board to the bracket.



| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L6 BZN (1) | Silver | 3.8 to 4.2 kgf-cm | 86.00J44.C60 |

**(2).** Pull the I/O board out of the bracket.
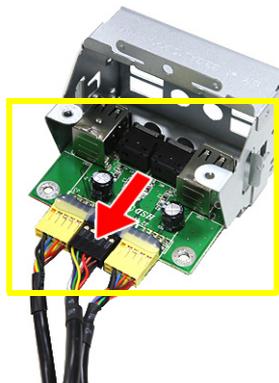


NOTE: The card has been highlighted with a yellow rectangle as above image shows.
Please detach the card and follow local regulations for disposal.

# Removing the Mainboard

1. See "Removing the Side Panel" on page 31.
2. See "Removing the Front Bezel" on page 32.
3. See "Removing the Heatsink Fan Assembly" on page 34.
4. See "Removing the Processor" on page 35.
5. See "Remove the HDD-ODD bracket." on page 36.
6. See "Removing the Memory Modules" on page 41.
7. See "Removing an Expansion Card" on page 42.
8. See "Removing the Front I/O and Card Reader Boards" on page 44.
9. For the X5400 model, disconnect the LED cable from its mainboard connector before proceeding.
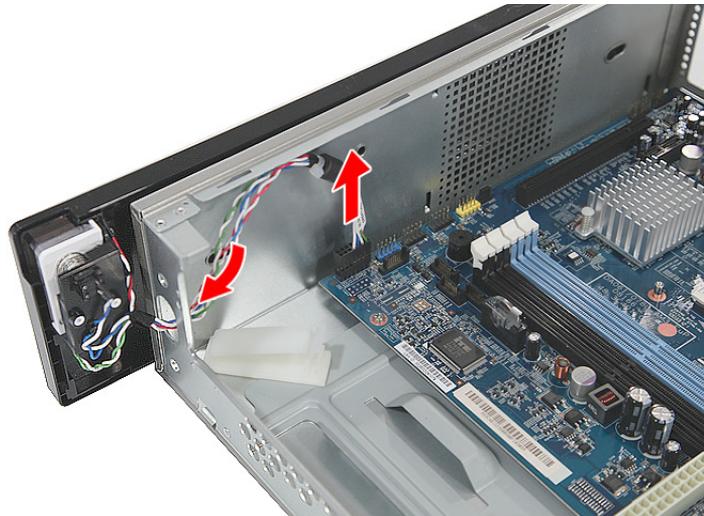


10. Remove the screw (B) on the rear panel.



|     X3400     |     X5400     |

| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| M3xL5 (1) | Black | 5.7 to 6.3 kgf-cm | 86.1A324.5R0 |

**11.** Remove the six screws (D) that secure the mainboard.
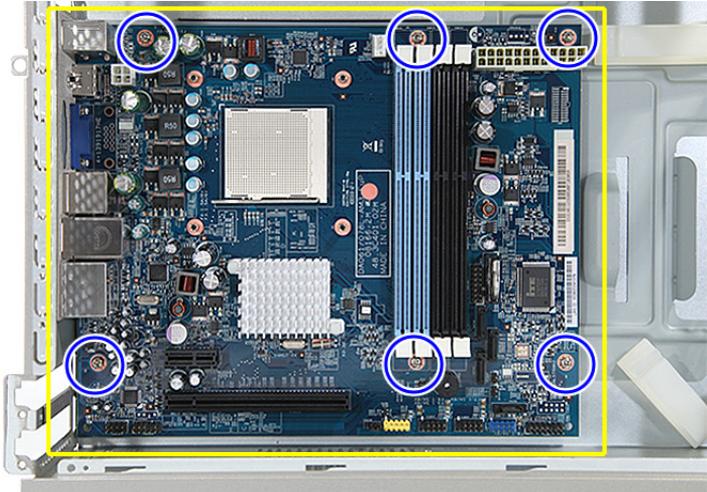


| Screw (Quantity) | Color | Torque | Part No. |
|---|---|---|---|
| #6-32 L6 NI (6) | Silver | 5.7 to 6.3 kgf-cm | 86.00J44.C60 |

**NOTE: The mainboard has been highlighted with a yellow rectangle as above image shows. Please detach the mainboard and follow local regulations for disposal.**

**12.** Lift the board off the housing.



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# Removing the Top Bezel

**NOTE:** The following instruction is applicable only to the X5400 model.

1. See "Removing the Side Panel" on page 31.

2. See "Removing the Front Bezel" on page 32.

3. Slide the bezel toward the front, then lift the bezel off the housing.

# System Troubleshooting

This chapter provides instructions on how to troubleshoot system hardware problems.

## Hardware Diagnostic Procedure

**IMPORTANT:** The diagnostic tests described in this chapter are only intended to test Acer products. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.

2. Verify the symptoms by attempting to recreate the failure by running the diagnostic tests or repeating the same operation.

3. Refer to "Power System Check" on page 52 and "Beep Codes" on page 58 to determine which corrective action to perform.

# System Check Procedures

## Power System Check

If the system will power on, skip this section. Refer to System External Inspection.

If the system will not power on, do the following:

❑ Check if the power cable is properly connected to the system and AC source.

❑ Check if the voltage selector switch is set to the correct voltage setting.

## System External Inspection

1. Inspect the LED indicators on the front panel, which can indicate the malfunction.   For the LED locations and description of their behaviour, see "System LED Indicators" on page 9.

2. Make sure that air flow is not blocked.

3. Make sure nothing in the system is making contact that could short out power.

4. If the problem is not evident, continue with System Internal Inspection.

## System Internal Inspection

1. Turn off the system and all the peripherals connected to it.

2. Unplug the power cord from the power outlets.

3. Unplug the power cord from the system.

4. Unplug all peripheral cables from the system.

5. Place the system unit on a flat, stable surface.

6. Remove the system covers. For instructions on removing system covers, refer to "System Disassembly" on page 27.

7. Verify that components are properly seated.

8. Verify that all cable connectors inside the system are firmly and correctly attached to their appropriate connectors.

9. Verify that all components are Acer-qualified and supported.

10. Replace the system covers.

11. Power on the system.

12. If the problem with the system is not evident, you can try viewing the POST messages and BIOS event logs during the system startup.

# Checkpoints

A checkpoint is either a byte or word value output to I/O port 80h. The BIOS outputs checkpoints throughout bootblock and Power-On Self Test (POST) to indicate the task the system is currently executing. Checkpoints are very useful in aiding software developers or technicians in debugging problems that occur during the pre-boot process.

# Viewing BIOS checkpoints

Viewing all checkpoints generated by the BIOS requires a checkpoint card, also referred to as a POST card or POST diagnostic card. These are ISA or PCI add-in cards that show the value of I/O port 80h on a LED display. Checkpoints may appear on the bottom right corner of the screen during POST. This display method is limited, since it only displays checkpoints that occur after the video card has been activated.

# Bootblock Initialization Code Checkpoints

The Bootblock initialization code sets up the chipset, memory, and other components before system memory is available. The following table describes the type of checkpoints that may occur during the bootblock initialization portion of the BIOS.

**NOTE:** Please note that checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

| Checkpoint | Description |
|---|---|
| Before D1 | Early chipset initialization is done.  Early super I/O initialization is done including RTC and keyboard controller.  NMI is disabled. |
| D0 | Go to flat mode with 4GB limit and GA20 enabled.  Verify the bootblock checksum. |
| D1 | Perform keyboard controller BAT test.  Check if waking up from power management suspend state.  Save power-on CPUID value in scratch CMOS. |
| D2 | Disable CACHE before memory detection.  Execute full memory sizing module.  Verify that flat mode is enabled. |
| D3 | If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code.  Do additional chipset initialization.  Re-enable CACHE.  Verify that flat mode is enabled. |
| D4 | Test base 512KB memory. Adjust policies and cache first 8MB. Set stack. |
| D5 | Bootblock code is copied from ROM to lower system memory and control is given to it.  BIOS now executes out of RAM. |
| D6 | Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced.  Main BIOS checksum is tested.  If BIOS recovery is necessary, control flows to checkpoint E0.  See Bootblock Recovery Code Checkpoints section for more information. |
| D7 | Restore CPUID value back into register.  The Bootblock-Runtime interface module is moved to system memory and control is given to it.  Determine whether to execute serial flash. |
| D8 | The Runtime module is uncompressed into memory.  CPUID information is stored in memory. |
| D9 | Store the Uncompressed pointer for future use in PMM.  Copying Main BIOS into memory.  Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM. |
| DA | Restore CPUID value back into register.  Give control to BIOS POST (ExecutePOSTKernel).  See POST Code Checkpoints section for more information. |

# Bootblock Recovery Code Checkpoints

The Bootblock recovery code gets control when the BIOS determines that a BIOS recovery needs to occur because the user has forced the update or the BIOS checksum is corrupt. The following table describes the type of checkpoints that may occur during the Bootblock recovery portion of the BIOS.

**NOTE:** Checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

| Checkpoint | Description |
| --- | --- |
| E0 | Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled. |
| E9 | Set up floppy controller and data. Attempt to read from floppy. |
| EA | Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM. |
| EB | Disable ATAPI hardware. Jump back to checkpoint E9. |
| EF | Read error occurred on media. Jump back to checkpoint EB. |
| E9 or EA | Determine information about root directory of recovery media. |
| F0 | Search for pre-defined recovery file name in root directory. |
| F1 | Recovery file not found. |
| F2 | Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file. |
| F3 | Start reading the recovery file cluster by cluster. |
| F5 | Disable L1 cache. |
| FA | Check the validity of the recovery file configuration to the current configuration of the flash part. |
| FB | Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify that the found flash part size equals the recovery file size. |
| F4 | The recovery file size does not equal the found flash part size. |
| FC | Erase the flash part. |
| FD | Program the flash part. |
| FF | The flash has been updated successfully. Make flash write disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h. |

# POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS preboot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS.

**NOTE:** Please note that checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

| Checkpoint | Description |
|---|---|
| 03 | Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags." |
| 04 | Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system |
| 05 | Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table. |
| 06 | Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock." |
| 08 | Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5. |
| 0A | Initializes the 8042 compatible Key Board Controller. |
| 0B | Detects the presence of PS/2 mouse. |
| 0C | Detects the presence of Keyboard in KBC port. |
| 0E | Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules. |
| 13 | Early POST initialization of chipset registers. |
| 24 | Uncompress and initialize any platform specific BIOS modules. GPNV is initialized at this checkpoint. |
| 30 | Initialize System Management Interrupt. |
| 2A | Initializes different devices through DIM. See DIM Code Checkpoints section for more information. |
| 2C | Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs. |
| 2E | Initializes all the output devices. |
| 31 | Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module. |
| 33 | Initializes the silent boot module. Set the window for displaying text information. |
| 37 | Displaying sign-on message, CPU information, setup key message, and any OEM specific information. |
| 38 | Initializes different devices through DIM. See DIM Code Checkpoints section for more information. USB controllers are initialized at this point. |
| 39 | Initializes DMAC-1 & DMAC-2. |

| Checkpoint | Description |
| --- | --- |
| 3A | Initialize RTC date/time. |
| 3B | Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system. |
| 3C | Mid POST initialization of chipset registers. |
| 40 | Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA…etc. |
| 50 | Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed. |
| 52 | Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory. Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed. |
| 60 | Initializes NUM-LOCK status and programs the KBD typematic rate. |
| 75 | Initialize Int-13 and prepare for IPL detection. |
| 78 | Initializes IPL devices controlled by BIOS and option ROMs. |
| 7C | Generate and write contents of ESCD in NVRam. |
| 84 | Log errors encountered during POST. |
| 85 | Display errors to the user and gets the user response for error. |
| 87 | Execute BIOS setup if needed / requested. Check boot password if installed. |
| 8C | Late POST initialization of chipset registers. |
| 8E | Program the peripheral parameters. Enable/Disable NMI as selected. |
| 90 | Late POST initialization of system management interrupt. |
| A0 | Check boot password if installed. |
| A1 | Clean-up work needed before booting to OS. |
| A2 | Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed. |
| A4 | Initialize runtime language module. Display boot option popup menu. |
| A7 | Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's. |
| A9 | Wait for user input at config display if needed. |
| AA | Uninstall POST INT1Ch vector and INT09h vector.  Deinitializes the ADM module. |
| AB | Prepare BBS for Int 19 boot. |
| AC | End of POST initialization of chipset registers. |
| B1 | Save system context for ACPI. |
| 00 | Passes control to OS Loader (typically INT19h). |

# DIM Code Checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system busses. The following table describes the main checkpoints where the DIM module is accessed.

**NOTE:** Checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

| Checkpoint | Description |
|---|---|
| 2A | Initialize different buses and perform the following functions: Reset, Detect, and Disable (function 0); Static Device Initialization (function 1); Boot Output Device Initialization (function 2). Function 0 disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. Function 1 initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. Function 2 searches for and initializes any PnP, PCI, or AGP video devices. |
| 38 | Initialize different buses and perform the following functions: Boot Input Device Initialization (function 3); IPL Device Initialization (function 4); General Device Initialization (function 5). Function 3 searches for and configures PCI input devices and detects if system has standard keyboard controller. Function 4 searches for and configures all PnP and PCI boot devices. Function 5 configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices. |

While control is in the different functions, additional checkpoints are output to port 80h as a word value to identify the routines under execution. The low byte value indicates the main POST Code Checkpoint. The high byte is divided into two nibbles and contains two fields. The details of the high byte of these checkpoints are as follows:

HIGH BYTE XY

The upper nibble 'X' indicates the function number that is being executed. 'X' can be from 0 to 7.

0 = func#0, disable all devices on the BUS concerned.

1 = func#1, static devices initialization on the BUS concerned.

2 = func#2, output device initialization on the BUS concerned.

3 = func#3, input device initialization on the BUS concerned.

4 = func#4, IPL device initialization on the BUS concerned.

5 = func#5, general device initialization on the BUS concerned.

6 = func#6, error reporting for the BUS concerned.

7 = func#7, add-on ROM initialization for all BUSes.

8 = func#8, BBS ROM initialization for all BUSes.

The lower nibble 'Y' indicates the BUS on which the different routines are being executed. 'Y' can be from 0 to 5.

0 = Generic DIM (Device Initialization Manager).

1 = On-board System devices.

2 = ISA devices.

3 = EISA devices.

4 = ISA PnP devices.

5 = PCI devices.

# Beep Codes

Beep codes are used by the BIOS to indicate a serious or fatal error to the end user. Beep codes are used when an error occurs before the system video has been initialized. Beep codes will be generated by the system board speaker, commonly referred to as the PC speaker.

AMIBIOS displays the checkpoints in the bottom right corner of the screen during POST. This display method is limited, since it only displays checkpoints that occur after the video card has been activated.

Not all computers using AMIBIOS enable this feature. In most cases, a checkpoint card is the best tool for viewing AMIBIOS checkpoints.

| Beep Symptom | Cause and Description |
|---|---|
| One short beep | System is ready. System is OK. |
| Continuous one long beep | Memory not installed or memory error. |
| One long beep and two short beeps then repeat. | VGA not installed or VGA error. Graphics card error/not installed, graphics card memory error or graphics card BIOS checksum error. |
| One long beep then two short beep | BIOS damaged. BIOS is damaged, BIOS POST jumps to Boot Block to execute the default procedures. |
| Two short beeps | CMOS damaged. CMOS checksum error or CMOS battery loss occurs. |

## Boot Block Beep Codes

| Number of Beeps | Description |
|---|---|
| 1 | No media present. Insert diskette in floppy drive A: |
| 2 | 'AMIBOOT.ROM' file not found in root directory of diskette in A: |
| 3 | Insert next diskette if multiple diskettes are used for recovery |
| 4 | Flash Programming successful |
| 5 | Floppy read error |
| 7 | No Flash EPROM detected |
| 10 | Flash Erase error |
| 11 | Flash Program error |
| 12 | 'AMIBOOT.ROM' file size error |
| 13 | BIOS ROM image mismatch (file layout does not match image present in flash device) |

## POST BIOS Beep Codes

| Number of Beeps | Description |
|---|---|
| 1 | Memory refresh timer error. |
| 3 | Base memory read/write test error |
| 6 | Keyboard controller BAT command field |
| 7 | General exception error (processor exception interrupt error) |
| 8 | Display memory error (system video adapter) |

**Troubleshooting POST BIOS Beep Codes**

| Number of Beeps | Description |
| --- | --- |
| 1,3 | Reseat the memory, or replace with known good modules. |
| 6,7 | Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards except the video adapter. <br><br> ❑ If beep codes are generated when all other expansion cards are absent, consult your system manufacturer's technical support. <br><br> ❑ If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning card. |
| 8 | If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty. |

# Error Messages

The following tables describes the error messages that may appear during POST. Each message is listed with a detailed description of the error.

## Memory

| Message Displayed | Description |
|---|---|
| Gate20 Error | The BIOS is unable to properly control the motherboard's Gate A20 function, which controls access of memory over 1 MB. This may indicate a problem with the motherboard. |
| Multi-Bit ECC Error | This message will only occur on systems using ECC enabled memory modules. ECC memory has the ability to correct single-bit errors that may occur from faulty memory modules. <br><br> A multiple bit corruption of memory has occurred, and the ECC memory algorithm cannot correct it. This may indicate a defective memory module. |
| Parity Error | Fatal Memory Parity Error. System halts after displaying this message. |
| RAM R/W test failed | This message is displayed by the AMIBIOS8 when the RAM read/write test fails. |
| CMOS Memory Size Wrong | The base memory (memory below 1MB) size that is reported in the CMOS (offset 15h) mismatches with the actual size detected. This condition may occur when the hole is set at 512K base memory or when CMOS is corrupted. |

## Boot

| Message Displayed | Description |
|---|---|
| Boot Failure ... | This is a generic message indicating the BIOS could not boot from a particular device. This message is usually followed by other information concerning the device. |
| Invalid Boot Diskette | A diskette was found in the drive, but it is not configured as a bootable diskette. |
| Drive Not Ready | The BIOS was unable to access the drive because it indicated it was not ready for data transfer. This is often reported by drives when no media is present. |
| A: Drive Error | The BIOS attempted to configure the A: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive. |
| B: Drive Error | The BIOS attempted to configure the B: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive. |
| Insert BOOT diskette in A: | The BIOS attempted to boot from the A: drive, but could not find a proper boot diskette. <br><br> Reboot and Select proper Boot device or Insert Boot Media in selected Boot device <br><br> BIOS could not find a bootable device in the system and/or removable media drive does not contain media. |
| NO ROM BASIC | This message occurs on some systems when no bootable device can be detected. |

# Storage Device

| Message Displayed | Description |
|---|---|
| Primary Master Hard Disk Error | The IDE/ATAPI device configured as Primary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Primary Slave Hard Disk Error | The IDE/ATAPI device configured as Primary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Secondary Master Hard Disk Error | The IDE/ATAPI device configured as Secondary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Secondary Slave Hard Disk Error | The IDE/ATAPI device configured as Secondary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 3rd Master Hard Disk Error | The IDE/ATAPI device configured as Master in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 3rd Slave Hard Disk Error | The IDE/ATAPI device configured as Slave in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 4th Master Hard Disk Error | The IDE/ATAPI device configured as Master in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 4th Slave Hard Disk Error | The IDE/ATAPI device configured as Slave in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 5th Master Hard Disk Error | The IDE/ATAPI device configured as Master in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 5th Slave Hard Disk Error | The IDE/ATAPI device configured as Slave in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 6th Master Hard Disk Error | The IDE/ATAPI device configured as Master in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 6th Slave Hard Disk Error | The IDE/ATAPI device configured as Slave in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Primary Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Primary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Primary Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Primary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Secondary Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Secondary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| Secondary Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Secondary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 3rd Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Master in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |

| Message Displayed | Description |
|---|---|
| 3rd Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Slave in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 4th Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Master in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 4th Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Slave in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 5th Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Master in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 5th Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Slave in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 6th Master Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Master in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| 6th Slave Drive - ATAPI Incompatible | The IDE/ATAPI device configured as Slave in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST. |
| S.M.A.R.T. Capable but Command Failed | The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk. |
| S.M.A.R.T. Command Failed | The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk. |
| S.M.A.R.T. Status BAD, Backup and Replace | A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure.This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk. |
| S.M.A.R.T. Capable and Status BAD | A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk. |

## Virus Related

| Message Displayed | Description |
|---|---|
| BootSector Write !! | The BIOS has detected software attempting to write to a drive's boot sector. This is flagged as possible virus activity. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup. |
| VIRUS: Continue (Y/N)? | If the BIOS detects possible virus activity, it will prompt the user. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup. |

# System Configuration

| Message Displayed | Description |
|---|---|
| DMA-1 Error | Error initializing primary DMA controller. This is a fatal error, often indication a problem with system hardware. |
| DMA-2 Error | Error initializing secondary DMA controller. This is a fatal error, often indication a problem with system hardware. |
| DMA Controller Error | POST error while trying to initialize the DMA controller. This is a fatal error, often indication a problem with system hardware. |
| Checking NVRAM..Update Failed | BIOS could not write to the NVRAM block. This message appears when the FLASH part is write-protected or if there is no FLASH part (System uses a PROM or EPROM). |
| Microcode Error | BIOS could not find or load the CPU Microcode Update to the CPU. This message only applies to INTEL CPUs. The message is most likely to appear when a brand new CPU is installed in a motherboard with an outdated BIOS. In this case, the BIOS must be updated to include the Microcode Update for the new CPU. |
| NVRAM Checksum Bad, NVRAM Cleared | There was an error in while validating the NVRAM data. This causes POST to clear the NVRAM data. |
| Resource Conflict | More than one system device is trying to use the same non-shareable resources (Memory or I/O). |
| NVRAM Ignored | The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST. |
| NVRAM Bad | The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST due to a data error. |
| Static Resource Conflict | Two or more Static Devices are trying to use the same resource space (usually Memory or I/O). |
| PCI I/O conflict | A PCI adapter generated an I/O resource conflict when configured by BIOS POST. |
| PCI ROM conflict | A PCI adapter generated an I/O resource conflict when configured by BIOS POST. |
| PCI IRQ conflict | A PCI adapter generated an I/O resource conflict when configured by BIOS POST. |
| PCI IRQ routing table error | BIOS POST (DIM code) found a PCI device in the system but was unable to figure out how to route an IRQ to the device. Usually this error is causing by an incomplete description of the PCI Interrupt Routing of the system. |
| Timer Error | Indicates an error while programming the count register of channel 2 of the 8254 timer. This may indicate a problem with system hardware. |
| Refresh timer test failed | BIOS POST found that the refresh timer hardware failed to pass the Refresh Retrace Test. |
| Interrupt Controller-1 error | BIOS POST could not initialize the Master Interrupt Controller. This may indicate a problem with system hardware. |

# CMOS

| Message Displayed | Description |
|---|---|
| CMOS Date/Time Not Set | The CMOS Date and/or Time are invalid. This error can be resolved by readjusting the system time in AMIBIOS Setup. |
| CMOS Battery Low | CMOS Battery is low. This message usually indicates that the CMOS battery needs to be replaced. It could also appear when the user intentionally discharges the CMOS battery. |
| CMOS Settings Wrong | CMOS settings are invalid. This error can be resolved by using AMIBIOS Setup. |
| CMOS Checksum Bad | CMOS contents failed the Checksum check. Indicates that the CMOS data has been changed by a program other than the BIOS or that the CMOS is not retaining its data due to malfunction. This error can typically be resolved by using AMIBIOS Setup. |

# Miscellaneous

| Message Displayed | Description |
|---|---|
| KBC BAT Test failed | Keyboard controller BAT test failed. This may indicate a problem with keyboard controller initialization. |
| Keyboard Error | Keyboard is not present or the hardware is not responding when the keyboard controller is initialized. |
| PS2 Keyboard not found | PS2 Keyboard support is enabled in the BIOS setup but the device is not detected. |
| PS2 Mouse not found | PS2 Mouse support is enabled in the BIOS setup but the device is not detected. |
| Keyboard/Interface Error | Keyboard Controller failure. This may indicate a problem with system hardware. |
| Unlock Keyboard | PS2 keyboard is locked. User needs to unlock the keyboard to continue the BIOS POST. |
| System Halted | The system has been halted. A reset or power cycle is required to reboot the machine. This message appears after a fatal error has been detected. |
| <INS> Pressed | Indicates that <INS> key is pressed during the BIOS POST. The POST will load and use default CMOS settings. |
| Password check failed | The password entered does not match the password set in the setup. This condition may occur for both Supervisor and User password verification. |
| Unknown BIOS error. Error code = 004Ah | This message is displayed when ADM module is not present in the AMIBIOS8 ROM. |
| Unknown BIOS error. Error code = 004Bh | This message is displayed when language module is not present in the AMIBIOS8 ROM. |
| Floppy Controller Failure | Error in initializing legacy Floppy Controller. |

## USB eModule Error Messages

| Message Displayed | Description |
| --- | --- |
| Warning! Unsupported USB device found and disabled! | This message is displayed when a non-bootable USB device is enumerated and disabled by the BIOS. |
| Warning! Port 60h/64h emulation is not supported by this USB Host Controller! | This message is displayed to indicate that port 60h/64h emulation mode cannot be enabled for this USB host controller. This condition occurs if USB KBC emulation option is set for non-SMI mode. |
| Warning! EHCI controller disabled. It requires 64bit data support in the BIOS. | This message is displayed to indicate that EHCI controller is disabled because of incorrect data structure. This condition occur if the USB host controller needs 64-bit data structure while the USB is ported with 32-bit data structure. |

## SMBIOS eModule Error Messages

| Message Displayed | Description |
| --- | --- |
| Not enough space in Runtime area!!. SMBIOS data will not be available. | This message is displayed when the size of the SMBIOS data exceeds the available SMBIOS runtime storage size. |

## CPU eModule Error Messages

| Message Displayed | Description |
| --- | --- |
| Warning! This system board does not support the power requirements of the installed processor. The processor will be run at a reduced frequency, which will impact system performance. | This message is displayed when the power requirements of the board do not match the power requirement of the CPU. |

## MPS Table (Multi-processor) eModule Error Messages

| Message Displayed | Description |
| --- | --- |
| Insufficient Runtime space for MPS data! System may operate in PIC or Non-MPS mode. | This message is displayed when there is not enough space in the 0F000h runtime area for creating MPS table. |

# BIOS Recovery

1. Prepare a USB storage device and keep it ready in hand.

   **(1).** Connect the USB storage device to a USB port on your computer.

   **(2).** Copy the target BIOS ROM file to a USB storage device.

   **(3).** Rename the target BIOS to "**amiboot.rom**".

   **(4).** Unplug the USB storage device.

2. Connect the USB storage device on the USB port on the system.

3. Power on the system. The system initializes the BIOS recovery process. Wait for about 3 minutes and the system will reboot automatically after the flash update is completed.
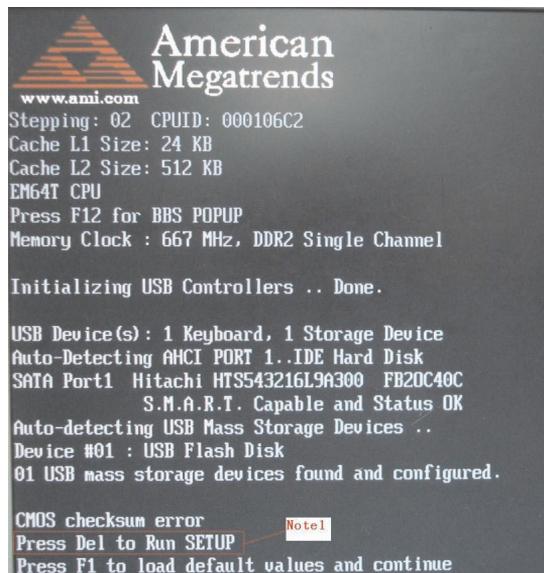
**4.** Press **Delete** to run the Setup Utility.
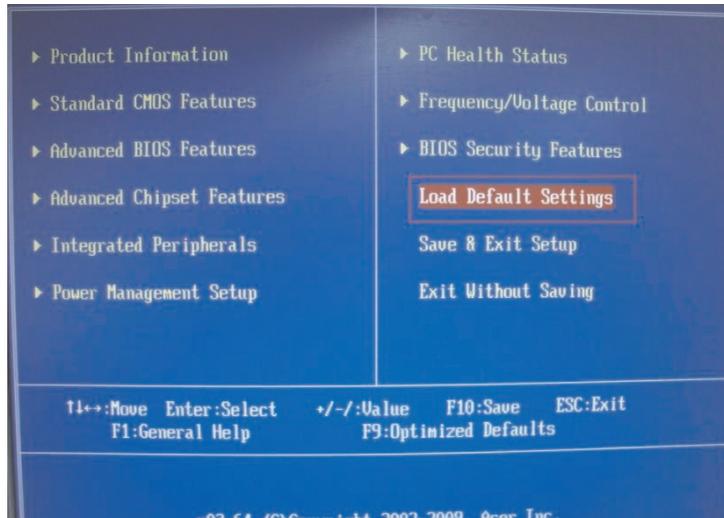


**5.** In the Setup Utility, select **Load Default Settings**, then press **Enter**.
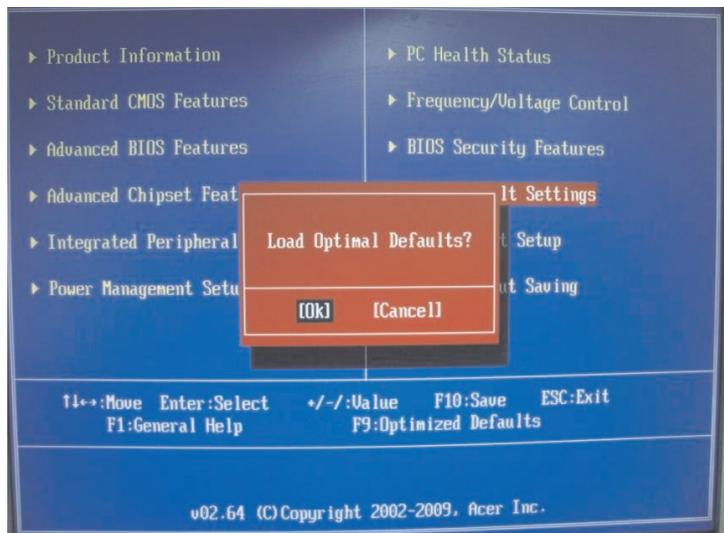


**6.** Select **Ok**, then press **Enter**.

**7.** Select **Save & Exit Setup**, then press **Enter**.

**8.** Select **Ok**, then press **Enter**.

# Undetermined Problems

The diagnostic problems does not identify which adapter or device failed, which installed devices are incorrect, whether a short circuit is suspected, or whether the system is inoperative.

**NOTE:** Verify that all attached devices are supported by the computer.

**NOTE:** Verify that the power supply being used at the time of the failure is operating correctly. (See "Power System Check" on page 52.)

Follow procedures below to isolate the failing FRU. Do not isolate non-defective FRU.

1.  Power off the computer.

2.  Visually check them for damage. If any problems are found, replace the FRU.

3.  Remove or disconnect all of the following devices:

    ❑ Non-Acer devices

    ❑ Printer, mouse, and other external devices

    ❑ Hard disk drive

    ❑ DIMM

    ❑ CD/DVD-ROM drive

    ❑ Adapter cards

4.  Power on the computer.

5.  Determine if the problem has been resolved.

6.  If the problem does not recur, reconnect the removed devices one at a time until you find the failed FRU.

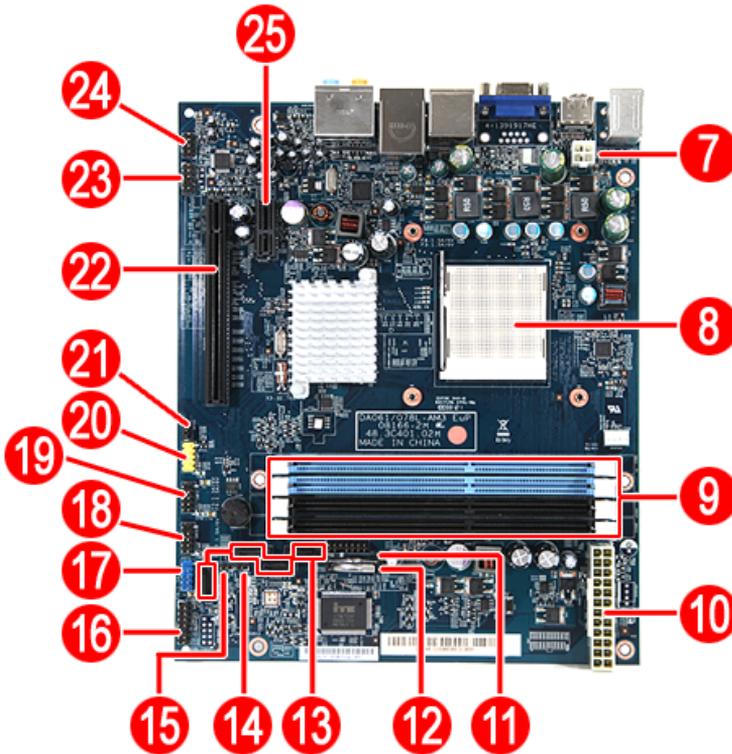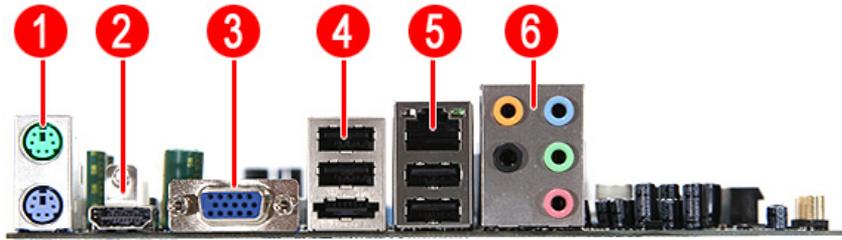7.  If the problem persists, replace the FRU one at a time. Do not replace a non-defective FRU.

# System Block Diagram and Board Layout

## System Block Diagram
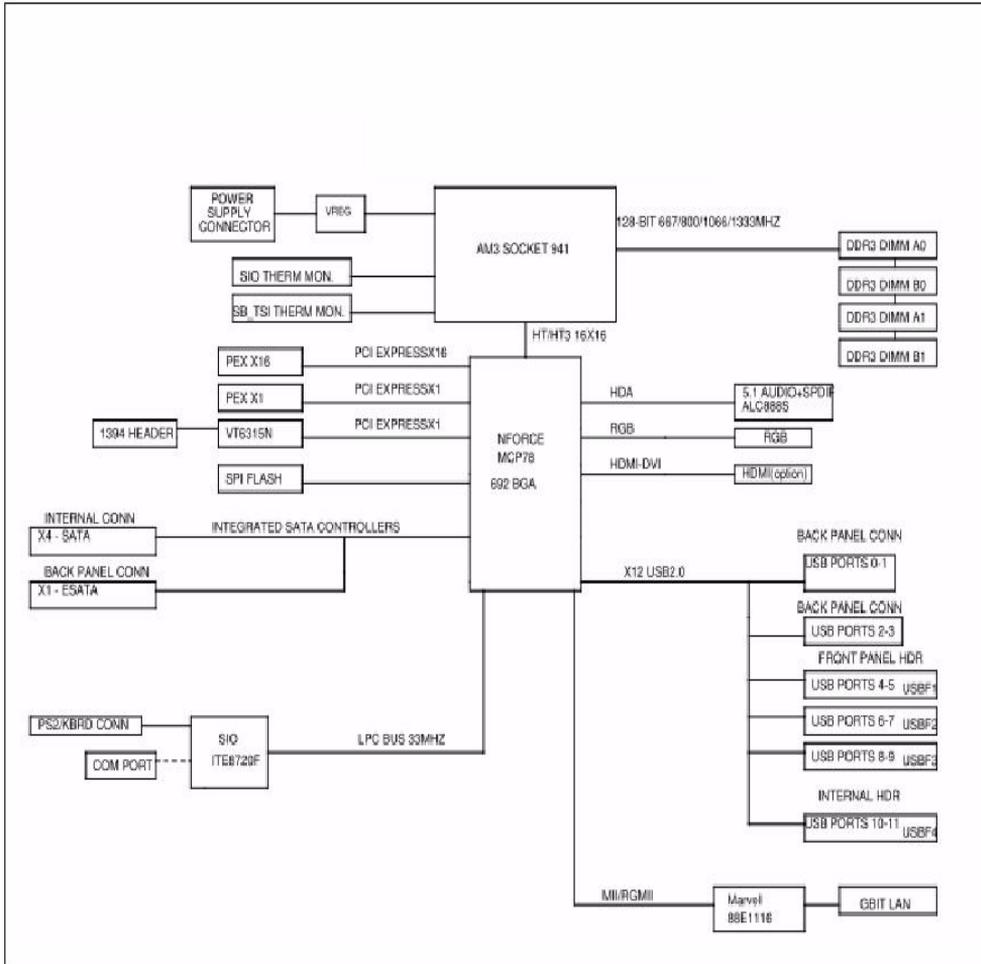
# Board Layout

## Mainboard



| No | Code | Description |
|----|------|-------------|
| 1 | KBMSCONN1 | Top: PS2 Mouse port |
| | | Bottom: PS2 Keyboard port |
| 2 | HDMI1 | HDMI port |
| 3 | VGA1 | VGA port |
| 4 | USBESATA1 | Top: USB ports |
| | | Bottom: eSATA port |
| 5 | USBLAN1 | Top: Gigabit LAN port |
| | | Bottom: USB ports |
| 6 | AUDJACK1 | Audio jack 5.1 channel |
| 7 | PWR1 | 4-pin ATX power connector |
| 8 | U9 | Processor socket |

| No | Code | Description |
|----|------|-------------|
| 9 | DIMM 1-4 | DDR3 DIMM slot |
| 10 | PWR2 | 24-pin ATX power connector |
| 11 | DEBUGH1 | 12 pin debug port |
| 12 | BT1 | RTC battery |
| 13 | SATA 1-4 | SATA 1-4 connectors |
| 14 | GPIOH2 | GPIOH2 header |
| 15 | GPIOH1 | GPIOH1 header |
| 16 | LEDH1 | Power and switch LED cable connector |
| 17 | USBF4 | USB connector |
| 18 | USBF3 | Front I/O board cable connectors |
| 19 | USBF2 | Front I/O board cable connectors |
| 20 | USBF1 | Front panel card reader board connectors |
| 21 | JBIOS1 | CMOS/NVRAM jumper<br>1-2 Normal (default)<br>2-3 Clear CMOS/NVRAM |
| 22 | PCIEX16 | PCI Express x16 slot |
| 23 | AUDIOF1 | Front audio connector |
| 24 | AUDIOS1 | Internal speaker |
| 25 | PCIEX1 | PCI Express x1 slot |

# FRU (Field Replaceable Unit) List

This chapter offers the FRU (Field Replaceable Unit) list in global configuration of the X3400/X5400 desktop computer. Refer to this chapter whenever ordering the parts to repair or for RMA (Return Merchandise Authorization).

NOTES:

❏ When ordering FRU parts, check the most up-to-date information available on your regional web or channel. For whatever reasons a part number is changed, it will NOT be noted on the printed Service Guide. For Acer authorized service providers, your Acer office may have a different part number code from those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts for service.

❏ To scrap or to return the defective parts, follow the local government ordinance or regulations on how to dispose it properly, or follow the rules set by your regional Acer office on how to return it.

❏ This document will be updated as more information about the FRU list becomes available.
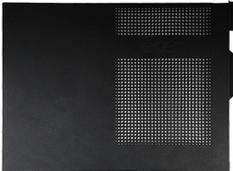
# Exploded Diagram

X3400
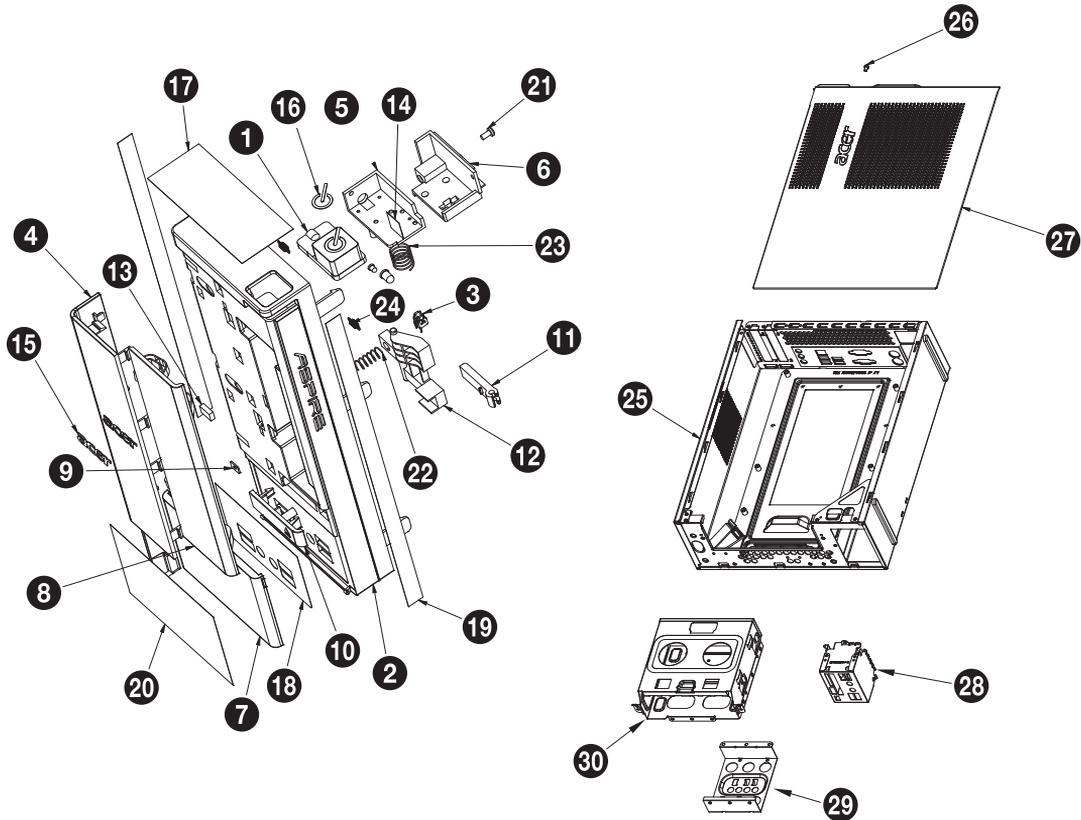


| No. | Part Name | No. | Part Name |
|-----|-----------|-----|-----------|
| 1 | PLT ACER LOGO BOXER X5 | 16 | MAGNET 10*6*3 |
| 2 | BEZEL FRONT B BOXER X550 | 17 | PLT ASPIRE LOGO BOXER X550 |
| 3 | CVR COSMETIC ART WORK BOXER X550 | 18 | PLT ODD KNOB LOGO BOXER X550 |
| 4 | CVR COSMETIC BOXER X550 | 19 | PROTECT FILM CVR FRONT |
| 5 | CVR FRONT BOXER X550 | 20 | PROTECT FILM DOOR ODD BOXER X550 |
| 6 | DOOR FIO LINK A BOXER X550 | 21 | PROTECT FILM F-IO BOXER X550 |
| 7 | DOOR FIO LINK B BOXER X550 | 22 | PROTECT FILM KNOB ODD BOXER X550 |
| 8 | DOOR IO BOXER X550 | 23 | SPG ODD LINK BOXER X310 |
| 9 | DOOR ODD BOXER X550 | 24 | SPRING ODD DOOR HD206A |
| 10 | GEAR PG-07A 7G | 25 | ASSY LCASE-ASM MCP61 BOXER X350 |
| 11 | IO DOOR BKT | 26 | SCREW #6-32 L5 PAN NI |
| 12 | KNOB ODD BOXER X550 | 27 | U-CASE |
| 13 | KNOB ODD LINK A BOXER X350 | 28 | FRONT IO BKT |
| 14 | KNOB ODD LINK BO BOXER X350 | 29 | HDD BKT |
| 15 | LATCH DOOR BOXER X5 | 30 | ODD BKT |

# X5400
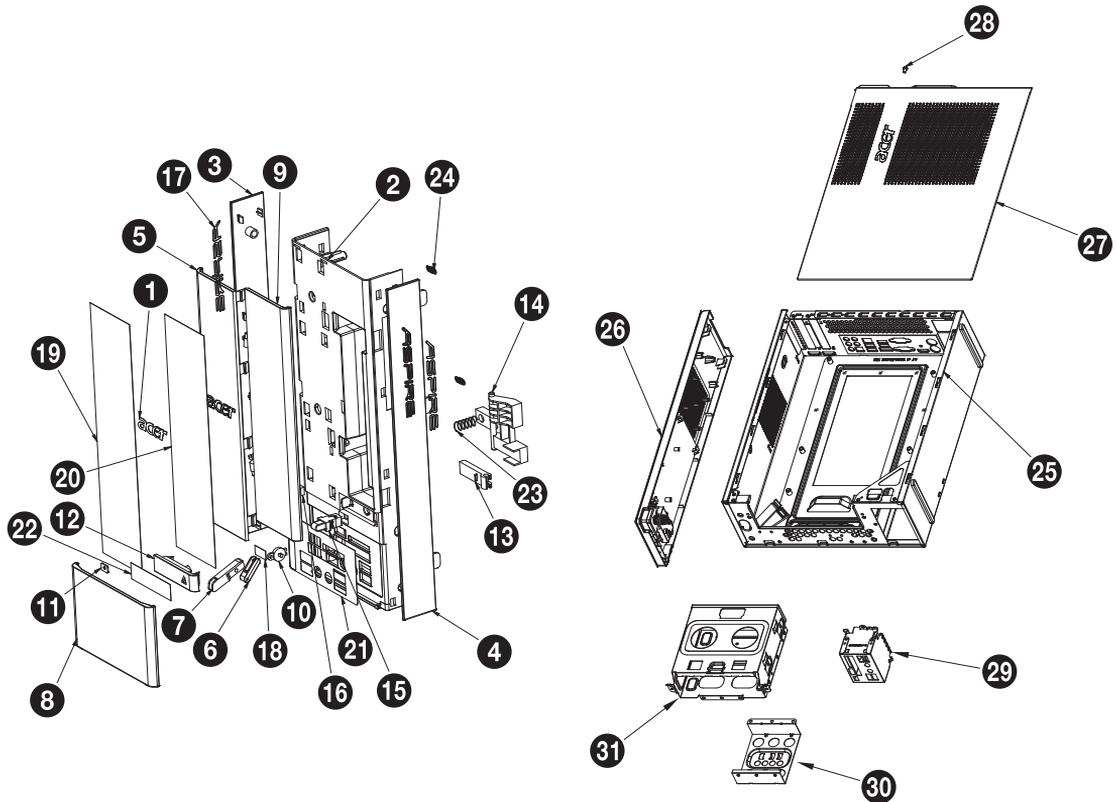


| No. | Part Name | No. | Part Name |
|---|---|---|---|
| 1 | PLT ACER LOGO BOXER X5 | 17 | PLT ASPIRE LOGO BOXER X550 |
| 2 | BEZEL FRONT B BOXER X550 | 18 | PLT ODD KNOB LOGO BOXER X550 |
| 3 | CVR COSMETIC ART WORK BOXER X550 | 19 | PROTECT FILM CVR FRONT |
| 4 | CVR COSMETIC BOXER X550 | 20 | PROTECT FILM DOOR ODD BOXER X550 |
| 5 | CVR FRONT BOXER X550 | 21 | PROTECT FILM F-IO BOXER X550 |
| 6 | DOOR FIO LINK A BOXER X550 | 22 | PROTECT FILM KNOB ODD BOXER X550 |
| 7 | DOOR FIO LINK B BOXER X550 | 23 | SPG ODD LINK BOXER X310 |
| 8 | DOOR IO BOXER X550 | 24 | SPRING ODD DOOR HD206A |
| 9 | DOOR ODD BOXER X550 | 25 | ASSY LCASE-ASM BOXER X550 |
| 10 | GEAR PG-07A 7G | 26 | ASSY TOP-COVER BOXER X550 |
| 11 | IO DOOR BKT | 27 | CAS UP BOXER X550 |
| 12 | KNOB ODD BOXER X550 | 28 | SCREW #6-32 L5 PAN NI |
| 13 | KNOB ODD LINK A BOXER X350 | 29 | FRONT IO BKT |
| 14 | KNOB ODD LINK BO BOXER X350 | 30 | HDD BKT |
| 15 | LATCH DOOR BOXER X5 | 31 | ODD BKT |
| 16 | MAGNET 10*6*3 | | |

# X3400 FRU List

| Category | Part Name | Acer Part No. |
|---|---|---|
| BOARDS | | |
| | FRONT IO BOARD CENTURY W/AUDIO CABLE*1&USB CABLE*2 | 55.SC101.001 |
| | CARD READER 9 IN 1 8.5L AU6476 W/USB2.0 & USB CABLE W/O 1394 | CR.10400.102 |
| | VGA CARD PCPARTNER 288-1N141-B00AC NVIDIA GT315 512MB SDDR3 DVI+HDMI LP (HYNIX) | VG.PCPT3.154 |
| CABLES | | |
| | POWER CORD 110V 3PIN UL USA | 27.01518.0I1 |
| | ODD SATA CABLE | 50.SC101.002 |
| | HDD SATA CABLE | 50.SC101.003 |
| | DVI TO VGA DONGLE CONNECTOR | D0.VGA26.P01 |
| | LED SWITCH CABLE | TBD |
| CASE/COVER/BRACKET ASSEMBLY | | |
| | FRONT IO BRACKET | TBD |
| | ASSEMBLY MAIN CHASSIS W/UCASE & LCASE FOR BOXER X350 | TBD |
| | UPPER CASE BOXER X350 | TBD |

| | ASSEMBLY LOWER CASE FOR BOXER X350 | TBD |
|---|---|---|
| | HDD&ODD COVER BRACKET | 33.SC101.002 |
| | FRONT BEZEL W/LED SWITCH CABLE FOR X350 | TBD |
| **CPU/PROCESSOR** | | |
| | CPU AMD PHENOM II X2 545 80W 3.0GHZ 7M TOTAL CACHE 80W CALLIST 1M L2 CACHE | KC.PH202.545 |
| **DVD-RW DRIVE** | | |
| | ODD PLDS SUPER-MULTI DRIVE HH 16X DH-16AASH BLACK BEZEL SATA FOR HF+WINDOWS7 | KU.0160F.009 |
| **HDD/HARD DISK DRIVE** | | |
| | HDD 500GB 3.5" 7200RPM SATA II 16MB HGST HDS721050CLA362 JUPITER | KH.50008.014 |
| **HEATSINK** | | |
| | CPU HEATSINK AIR COOLER LGA775 TMDC6 NEW SPRIG | HI.10800.028 |
| **KEYBOARD** | | |
| | KEYBOARD USB 104 KEY CHICONY KU-07603US25522V BLACK US W/O EKEY | KB.USB03.192 |
| **MAINBOARD** | | |
| | MAINBOARD DA078L/ABOXER2 EUP W/RTC BATTERY W/O 1394 LF DDRIII 4 DIMM & CPU & MEMORY | MB.SE201.001 |
| **MEMORY** | | |
| | MEMORY NANYA DDR3 1333MHZ 2G NT2GC64B8HA0NF-CG | KN.2GB0G.015 |

| KEYBOARD | | |
|---|---|---|
| | KEYBOARD USB 104 KEY CHICONY KU-07603US25522V BLACK US W/O EKEY | KB.USB03.192 |
| POINTING DEVICE | | |
| | MOUSE USB OPT SM-9625 LITEON SM-30700-00W | MS.11200.018 |
| POWER SUPPLY | | |
| | POWER SUPPLY 220W EUP 115VAC/230V NPFC DELTA DPS-220UB A EUP | PY.2200F.006 |
| SCREWS | | |
| | SCREW I NO6-32 L5 BZN | 86.00J07.B60 |
| | SCREW PAN #6-32 L6 NI BOXER WZS | 86.00J44.C60 |
| | SCREW #6-32 L5 PAN NI | 86.00J90.B60 |
| | SCREW NO4-40 L6.5 PAN NI | 86.00N03.B40 |
| | SCREW PAN M3 L5 BZN | 86.1A324.5R0 |
| | SCREW FLAT #6-32*3/16 NI | 86.5A5B6.012 |
| | SPEAKER CHIAMAW 9M-20A200-000 ACER LOGO LF 0810 | SP.10600.011 |

# X5400 FRU List

System model:ACER_AX5400 ABOXER II (NO: 91.3C401.A01)

| Category | Part Name | Acer Part No. |
|---|---|---|
| BOARDS | | |
|  | FRONT IO BOARD CENTURY W/AUDIO CABLE*1&USB CABLE*2 | 55.SC101.001 |
|  | CARD READER 9 IN 1 8.5L AU6476 W/USB2.0 & USB CABLE W/O 1394 | CR.10400.102 |
|  | VGA CARD PCPARTNER 288-1N141-A00AC NVIDIA GT315 512MB SDDR3 DVI+HDMI ATX (SAMSUNG) | VG.PCPT3.154 |
| CABLES | | |
|  | POWER CORD 110V 3PIN UL USA | 27.01518.0I1 |
|  | ODD SATA CABLE | 50.SC101.002 |
| | HDD SATA CABLE | 50.SC101.003 |
| | DVI TO VGA DONGLE CONNECTOR | D0.VGA26.P01 |
|  | LED SWITCH CABLE | TBD |
| CASE/COVER/BRACKET ASSEMBLY | | |
|  | FRONT IO BRACKET | TBD |
|  | ASSEMBLY MAIN CHASSIS W/UCASE & LCASE & TOP COVER FOR BOXER X550 | TBD |
|  | UPPER CASE BOXER X550 | TBD |

| Category | Part Name | Acer Part No. |
|---|---|---|
| | ASSEMBLY LOWER CASE FOR BOXER X550 | TBD |
| | ASSEMBLY TOP COVER W/LED SWITCH CABLE FOR BOXER X550 | TBD |
| | HDD&ODD COVER BRACKET | 33.SC101.002 |
| | FRONT BEZEL W/LED SWITCH CABLE FOR X550 | TBD |
| CPU/PROCESSOR | | |
| | CPU AMD ATHLON II X2 80W 3.0GHZ 7M TOTAL CACHE 80W CALLIST 1M L2 CACHE | KC.PH202.545 |
| DVD-RW DRIVE | | |
| | ODD HLDS SUPER-MULTI DRIVE HH 16X GH41N BLACK BEZEL SATA HF + WIN 7 | KU.0160F.009 |
| HDD/HARD DISK DRIVE | | |
| | HDD 3.5" 500GB 7200RPM SATA SEAGATE PHARAOH ST3500418AS | KH.50008.014 |
| HEATSINK | | |
| | CPU HEATSINK AIR COOLER LGA775 TMDC6 NEW SPRIG | HI.10800.028 |
| MAINBOARD | | |
| | MAINBOARD DA078L/ABOXER2 EUP W/RTC BATTERY W/O 1394 LF DDRIII 4 DIMM & CPU & MEMORY | MB.SE201.001 |
| MEMORY | | |
| | MEMORY SAMSUNG DDR3 1333MHZ 2G M378B5673DZ1-CH9 | KN.2GB0G.015 |

| Category | Part Name | Acer Part No. |
|---|---|---|
| KEYBOARD | | |
| | KEYBOARD USB 104 KEY LITE-ON SK-9625S SG-30703-XUW BLACK US WITH NEW COLOR AC-MT-018 | KB.USB0B.082 |
| POWER SUPPLY | | |
| | POWER SUPPLY 220W PFC 230V DELTA DPS-220UB-1 A EUP | PY.2200F.006 |
| SCREWS | | |
| | SCREW I NO6-32 L5 BZN | 86.00J07.B60 |
| | SCREW PAN #6-32 L6 NI BOXER WZS | 86.00J44.C60 |
| | SCREW #6-32 L5 PAN NI | 86.00J90.B60 |
| | SCREW NO4-40 L6.5 PAN NI | 86.00N03.B40 |
| | SCREW PAN M3 L5 BZN | 86.1A324.5R0 |
| | SCREW FLAT #6-32*3/16 NI | 86.5A5B6.012 |
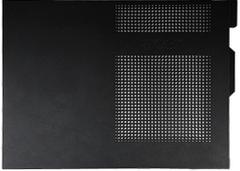
# Technical Specifications

This section provides technical specifications for the system.

**Processor**

**AMD Phenom II X4**

| Item | Specification | | | | | | |
|---|---|---|---|---|---|---|---|
| Model number | 805 | 810 | 820 | 900E | 905E | 910 | 925 |
| Frequency (GHz) | 2.5 | 2.6 | 2.8 | 2.4 | 2.5 | 2.6 | 2.8 |
| Total L2 cache (MB) | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| L3 cache (MB) | 4 | 4 | 4 | 6 | 6 | 6 | 6 |
| Socket | AM3 | | | | | | |
| Thermal design power (W) | 95 | 95 | 95 | 65 | 65 | 95 | 95 |
| Voltage | 0.875 - 1.425 | 0.875 - 1.425 | 0.9 - 1.425 | 0.850 - 1.250 | 0.825 - 1.250 | 0.875 - 1.425 | 0.9 - 1.400 |

**AMD Phenom II X3**

| Item | Specification | | | | | | |
|---|---|---|---|---|---|---|---|
| Model number | 545 | 550 | 700E | 705E | 710 | 720 | 740 |
| Frequency (GHz) | 3.0 | 3.0 | 2.4 | 2.5 | 2.6 | 2.6 | |
| Total L2 cache (MB) | 1 | 1 | 1.5 | 1.5 | 1.5 | 2 | |
| L3 cache (MB) | 6 | 6 | 6 | 6 | 6 | 6 | |
| Socket | AM3 | | | | | | |
| Thermal design power (W) | 80 | 80 | 65 | 65 | 65 | 95 | |
| Voltage | 0.875 - 1.425 | 0.875 - 1.425 | 0.825 - 1.25 | 0.800 - 1.25 | 0.875 - 1.425 | 0.850 - 1.425 | |

**System Board Major Chips**

| Item | Specification |
|---|---|
| System core logic | AMD processor + nVIDIA GeForce 8200 (MCP78PV) |
| Video controller | nVIDIA GeForce 8200 (MCP78PV) |
| PCI controller | nVIDIA GeForce 8200 (MCP78PV) |
| LAN controller | Marvell 88E1116 Intel WG82567V Gigabit NIC |
| Audio controller | HD audio codec ALC888S |
| USB controller | nVIDIA GeForce 8200 (MCP78PV) |
| Super I/O controller | SIO ITE 8720 |

**System Memory**

| Item | Specification | | |
|------|---------------|---|---|
| Memory type | DDR3-667/800/1066/1333 unbuffered DIMM | | |
| Module name | PC3-8500/10600 | | |
| Organization | ECC | | |
| DIMM sockets | Four | | |
| DIMM size | 1 GB or 2 GB | | |
| Minimum memory | 1 GB | | |
| Maximum memory | 8 GB | | |
| | Nanya<br>NT1GC64B88A0NF-CG<br>NT2GC64B8HA0NF-CG | Samsung<br>M378B2873EH1-CH9<br>M378B5673DZ1-CH9<br>M378B5673EH1-CH9 | Hynix<br>HMT112U6BFR8C-H9<br>HMT125U6BFR8C-H9 |
| DIMM size (GB) | 1, 2 | 1, 2 | 1, 2 |
| Pin | 240 | 240 | 240 |

**System BIOS**

| Item | Specification |
|------|---------------|
| BIOS vendor | American Megatrends Inc. |
| BIOS version | P01-B0 |

**Hard Disk Drive**

| Item | Specification | | |
|------|---------------|---|---|
| Vendor | WD | Seagate | HGST |
| Model no. | WD3200AAJS-22L7A0<br>WD5000AAKS-22V1A0<br>WD6400AAKS-22A7B2<br>WD10EADS-22M2B0<br>WD15EADS-22P8B0<br>WD20EADS-22R6B0 | 320GB 3.5" PHARAOH<br>ST3500418AS<br>ST31000528AS<br>ST31500341AS | HDT721032SLA380<br>HDS721032CLA362<br>HDS721050CLA362<br>HDT721064SLA360<br>HDS721064CLA332<br>HDS721010CLA332<br>HDT721010SLA360 |
| Capacity (GB) | 320, 500, 640, 1000 | | |
| Interface | SATA II | SATA II | SATA II |
| Size | 3.5-inch | 3.5-inch | 3.5-inch |
| Transfer rate (Gb/s) | 3 | 3 | 3 |
| Spindle speed (RPM) | 7200 | 7200 | 7200 |
| Cache (MB) | 8, 16 | | |

**VGA Interface**

| Item | Specification |
|------|---------------|
| VGA controller | nVIDIA GeForce 8200 (MCP78PV) |
| Connector | VGA/monitor port |

**PCI Interface**

| Item | Specification |
|------|---------------|
| PCI controller | nVIDIA GeForce 8200 (MCP78PV) |
| Number of slots | PCI Express x 1 slot<br>PCI Express x16 slot |

**Network Interface**

| Item | Specification |
|------|---------------|
| LAN controller | nVIDIA GeForce 8200 (MCP78PV) + Marvell 88E1116 Intel WG82567V Gigabit NIC |
| Supports LAN protocol | 10/100/1000 Mbps |
| LAN connector type | RJ45 |

**SATA Interface**

| Item | Specification |
|------|---------------|
| SATA controller | Embedded SATA controller |
| Connectors | Two onboard SATA ports and one eSATA port |

**Audio Interface**

| Item | Specification |
|------|---------------|
| Audio controller | HD audio codec ALC888S |
| Connectors | Audio 5.1 channel |

**Keyboard and Input Devices**

| Item | Specification |
|------|---------------|
| Controller | nVIDIA GeForce 8200 (MCP78PV) + SIO ITE8720 |
| Connectors | • PS2 keyboard and mouse connector<br>• Nine USB ports (five on front and four on rear) |

**Optical Drive**

**BD Combo Module**

| Item | Specification | |
|------|---------------|---|
| Vendor | HLDS | |
| Model name | BH30N | CH20N |
| Drive type | BD-Rewriter | BD-Combo |
| Write Speed | BD-R (SL/DL) 2x, 4x CLV, 6x PCAV / 2x, 4x CLV, 6x PCAV<br>BD-R (SL L to H) 2x CLV<br>BD-RE (SL/DL) 2x / 2x CLV<br>DVD-R 2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV<br>DVD-R DL 2x, 4x CLV<br>DVD-RW (SL/DL) 1x, 2x, 4x, 6x CLV / Not support<br>DVD-RAM 2x, 3x CLV, 3-5x PCAV<br>DVD+R 2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV<br>DVD+R DL 2.4x, 4x CLV<br>DVD+RW (SL/DL) 2.4x, 4x, 6x CLV, 8x ZCLV / Not support<br>CD-R 8x, 16x CLV, 24x, 32x PCAV, 40x CAV<br>CD-RW 4x, 10x, 16x CLV, 24x ZCLV | DVD-R2x, 4x CLV, 8x ZCLV, 8x PCAV, 12x PCAV, 16x CAV<br>DVD-R DL 2x, 4x CLV<br>DVD-RW2x, 4x, 6x CLV<br>DVD-RAM2x, 3x CLV, 5x PCAV<br>DVD+R2.4x, 4x CLV, 8x ZCLV, 8x PCAV, 12x PCAV, 16x CAV<br>DVD+R DL2.4x, 4x CLV<br>DVD+RW2.4x, 4x, 6x CLV, 8x ZCLV<br>CD-R8x, 16x CLV, 24x, 32x PCAV, 40x CAV<br>CD-RW4x, 10x, 16x CLV, 24x ZCLV |
| Read Speed | BD-ROM(SL/DL)6xCAV/6xCAV<br>BD-R (SL L to H) 4x CAV<br>BD-R (SL/DL)6x CAV / 6x CAV<br>BD-RE (SL/DL)4.8x CAV / 4.8x CAV<br>BDMV (AACS Compliant Disc) 4.8x CAV<br>DVD-ROM (SL/DL)16x CAV / 8x CAV<br>DVD-R(SL/DL)16xCAV/8xCAV<br>DVD-RW (SL/DL) 10x CAV / Not support<br>DVD+R (SL/DL)16x CAV / 8x CAV<br>DVD+RW (SL/DL)10x CAV / Not support<br>DVD-RAM 2x, 3x CLV, 3 - 5x PCAV<br>DVD-Video (CSS Compliant Disc)8x CAV (SL/DL)<br>CD-R/RW/ROM40x / 40x / 40x CAV<br>CD-DA (DAE) 40x CAV80 mm CD 16x CAV | BD-ROM (SL/DL)6x / 4.8x CAV<br>BD-R (SL/DL)6x / 4.8x CAV<br>BD-RE (SL/DL)4.8x / 4.8x CAV<br>BDMV (AACS Compliant Disc) 4.8x CAV<br>DVD-ROM (SL/DL)16x / 8x CAV DVD-R (SL/DL)16x / 8x CAV<br>DVD-RW (SL/DL)10x CAV / Not support DVD+R (SL/DL)16x / 8x CAV<br>DVD+RW (SL/DL)10x CAV / Not support<br>DVD-RAM 2x, 3x ZCLV, 5x PCAV<br>DVD-Video (CSS Compliant Disc) (SL/DL) 8x CAV<br>CD-R/ROM40x CAV CD-RW 40x CAV<br>CD-DA (DAE) 32x CAV<br>Video CD 10x CAV<br>80 mm CD 10x CAV |
| Data Transfer Rate | BD-ROM 35.965 Mbits/s<br>DVD-ROM 1.85Mbytes/s<br>CD-ROM 150KB/s | BD-ROM 215.79 Mbits/s (6x) max.<br>DVD-ROM 22.16 Mbytes/s (16x) max.<br>CD-ROM 6,000 kB/s (40x) max. |
| Access Time | BD-ROM        180 ms typ<br>DVD-ROM        160 ms typ.<br>DVD-RAM        180 ms typ.<br>CD-ROM        150 ms typ. | BD-ROM 180 ms typ<br>DVD-ROM 150 ms typ.<br>DVD-RAM 180 ms typ.<br>CD-ROM 150 ms typ. |
| Buffer Size | 4 MB | 4 MB |
| Interface Type | Serial ATA | Serial ATA |

**Super Multi**

| Item | Specification | |
|---|---|---|
| Vendor | HLDS | PLDS |
| Model Name | GH-41N | DH-16AASH |
| Drive Type | Super Multi | Super Multi |
| Write Speed | CD-R: 4x, 8x, 16x CLV, 24x, 32x, 40x PCAV<br>CD-RW: 4x, 10x,16x CLV, 24x, 32x ZCLV<br>(High Speed: 10x, Ultra Speed: 16x, 24x, US Plus: 16x, 24x, 32x)<br>DVD+R:2.4x, 4x, 6x CLV, 8x,12x ZCLV, 8x, 12x PCAV, 16x CAV<br>DVD+R DL:2.4x, 4x , 6x CLV, 8x ZCLV<br>DVD+RW:2.4x, 4x, 6x CLV, 8x ZCLV<br>(High Speed DVD+RW: 6x CLV, 8x ZCLV)<br>DVD-R:2x, 4x, 6x CLV, 8x ZCLV, 8x PCAV, 16x CAV<br>DVD-R DL:2x, 4x, 6x CLV, 8x ZCLV<br>DVD-RW:1x, 2x, 4x, 6x CLV<br>DVD-RAM:2x, 3x  ZCLV, 3x-5x PCAV (Ver.2.2) | CD-R: 16x CLV,  24x 17x ~ 24x PCAV, 32x 17x ~ 32x PCAV, 40x 17x ~ 40x CAV<br>CD-RW: 4x CLV,  10x CLV, 16x CLV, 24x 16x-24x Zone-CLV1,  16x CLV, 24x / 32x 16x-24x-32x Zone CLV2<br>DVD+R: 24x / 32x 16x-24x-32x Zone CLV2, 4x / 6x CLV, 8x PCAV<br>DVD+R9: 12x / 16x CAV, 2.4x / 4x CLV, 6x / 8x Zone CLV, 12x CAV<br>DVD+RW: 2.4x / 4x / 6x CLV 8x Zone CLV<br>DVD-R: 4x / 6x CLV, 8x PCAV<br>DVD-R9: 12x / 16x CAV, 4x CLV 6x / 8x Zone CLV 12x CAV<br>DVD-RW 2x / 4x CLV, 6x Zone CLV<br>DVD-RAM 2x / 3x / 5x / 6x CLV, 8x / 12x PCAV |
| Read Speed | CD-R/RW/ROM:40x/40x/40x max.<br>CD-DA (DAE):40x max.<br>80 mm CD:10x max<br>DVD+R/+RW:10x / 8x max.<br>DVD+R DL:8x max.<br>DVD-R/RW/ROM(SL/DL):10x / 8x / 16x / 12x max.<br>DVD-R DL:8x max.<br>DVD-RAM (Ver.1.0/2.2):2x/ 3x-5x PCAV | CD-ROM: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x / 19.2x~48x CAV<br>CD-RW: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x CAV<br>CD-R/RW: 8x CLV<br>DVD-ROM (single layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x / 6.4x~16x CAV<br>DVD-ROM (dual layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x<br>DVD+R: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x CAV<br>DVD-R: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x<br>DVD+RW: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV<br>DVD-RW: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV<br>DVD+R9: 4x / 8x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV<br>DVD-R9: 2x / 4x CLV, 2x / 3x / 5x / 6x CAV<br>DVD-RAM: 2x / 3x / 5x / 6x CLV, 8x / 12x PCAV |
| Data Transfer Rate | CD-ROM:6,000 kB/s (40x) max.<br>DVD-ROM:22.16 MB/s  (16x) max. | CD-ROM: 7150 KB/s<br>DVD-ROM: 20.85 MB/s |
| Access Time | CD-ROM: 125 ms<br>DVD-ROM: 145 ms | CD-ROM: 140 ms<br>DVD-ROM: 160/180 ms |

**Super Multi**

| Item | Specification | |
|------|---------------|---|
| Buffer Size | 2 MB | 2 MB |
| Interface Type | Serial ATA | Serial ATA |